ENGINEERING NEWS-RECORD

Big changes in midtown Manhattan p. 40

A McGRAW-HILL PUBLICATION

E B POWER
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NEW ARMCO GATES!

Expanded Armco Line NOW Meets Water Works and Sewage Plant Needs

To better serve your gate requirements, we are making important additions to our line of gates.

Armco has acquired the facilities of Morse Brothers Machinery Company of Denver for the manufacture of Pekrul water control gates. These well-known products, primarily designed for water filtration and sewage treatment plant applications, have been added to the broad Armco line of irrigation and water-control gates. With this complete selection, it will be easy to select the proper gate to meet your requirements.

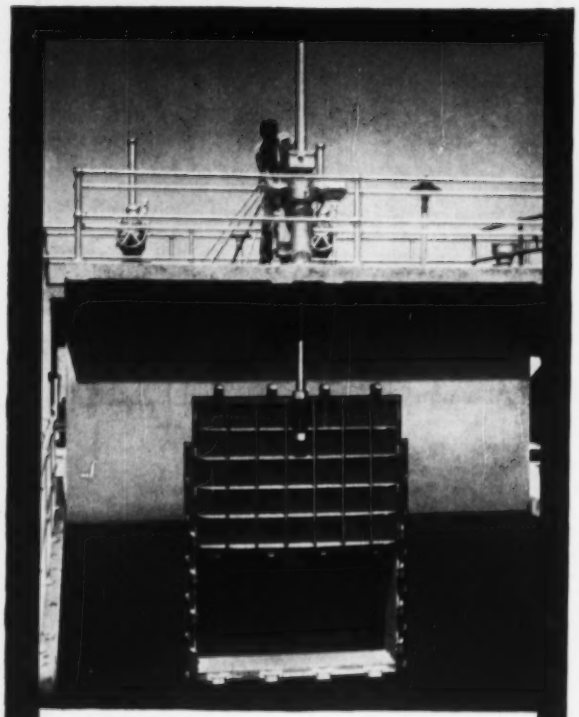
For complete details, call your nearby Armco Sales Engineer.

"One Source" Buying Saves Time, Trouble

Usually, water filtration and sewage plant projects involve many other products supplied by Armco. These range from foundation pipe and sheeting to corrugated metal pipe, welded steel pipe and tunnel liner plates.

As the leading manufacturer of corrugated metal pipe, Armco offers corrugated structures in a wide selection of sizes, shapes and coatings. These products include Armco ASBESTOS-BONDED® Pipe and Armco SMOOTH-FLO Sewer Pipe.

By ordering your drainage and construction needs from this single source, you save time, trouble and money. For details on these products, see your Armco Sales Engineer. Armco Drainage & Metal Products, Inc., 3567 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.



Typical gate added to the Armco line to meet municipal and industrial requirements.

ARMCO®

Artist's drawing of new plant in Denver, Colorado. Here Armco Gates are produced by the most modern equipment.

ALLIS-CHALMERS ADVANCED DESIGN

turns waste time into work time

You get *extra* money-making *work time* with an Allis-Chalmers crawler tractor on every job—dozing, winching, towing, pushing. Built for today's jobs, these crawlers are wheeling out more work in less time than comparable size machines.

Look at the facts

1,000-hour lubrication intervals save lube time

Allis-Chalmers tractors start the day with *go*—not greasing. You can operate six months on a 40-hour week basis with just one lubrication of truck wheels, front idlers and support rollers. Designed with Positive Seals and tapered roller bearings, these units are protected from dust, loose sand, soft ground, mud or water. You not only gain *working time*, but save labor and lubricant costs as well. And there's no costly damage from greasing neglect.

Modern shift pattern speeds digging

Here's a big timesaver on dozer work. It takes just half the time and effort to change from low forward to fast reverse with the Allis-Chalmers HD-6, HD-11, or HD-16 transmission. One simple shift of the gear lever does the job. You gain production time—up to 25 percent on actual test—on bulldozing, backfilling and other jobs calling for a short forward-backward cycle.

Unit construction cuts servicing time

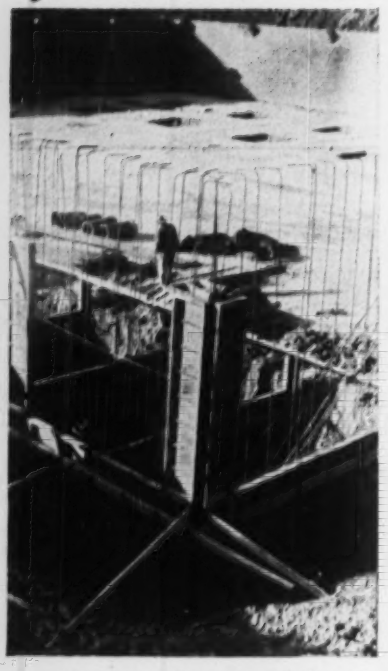
No need to remove transmission or engine, radiator, grille, when servicing or removing an Allis-Chalmers master clutch. This unit can be removed without disturbing adjacent parts. This is also true of other main assemblies—final drive gear, transmission, steering clutches, engine and truck frame. You can quickly substitute an assembly and put the tractor to work while servicing the original unit. As a result, hours of *costly service and downtime are saved* because of Allis-Chalmers advanced design.

These are just three examples of Allis-Chalmers timesaving, money-making features. Your Allis-Chalmers dealer can point out many more. See him now for the full story.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

Symons FIELD REPORT...



Contractor Saves 40% with Symons Forms . . .

7,500 square feet of Symons Standard Forms were used in the new 2 million gallon capacity pumping station at Melrose Park, Illinois. 2,000 cubic yards of concrete were used on the job and the concrete contractor, Louis Macro Company, Melrose Park, reported a 40 per cent saving through the use of Symons Forms. Walls for the job were completed in three pours.

Symons engineering service can help you realize substantial savings in forming. With your plans, our engineers will prepare a complete form layout, bill of materials, and make recommendations for the most efficient and cost saving method of forming.

Our field service representatives are sales engineers, ready and able to advise you on form erection, pouring and stripping methods that will help you save time, labor and materials. You can call on them to assist you on any forming problems.

Symons Forms can be rented with purchase option. Symons Clamp & Mfg. Co., 4265 Diversey Avenue, Dept. L-6, Chicago 39, Illinois.

San Cornigila Company, Melrose Park, Illinois
General Contractor.

Catalogs and Added Information on
FORMS—CLAMPS—SHORES
Sent on Request

ENGINEERING NEWS-RECORD

EIGHTY-SECOND YEAR OF PUBLICATION

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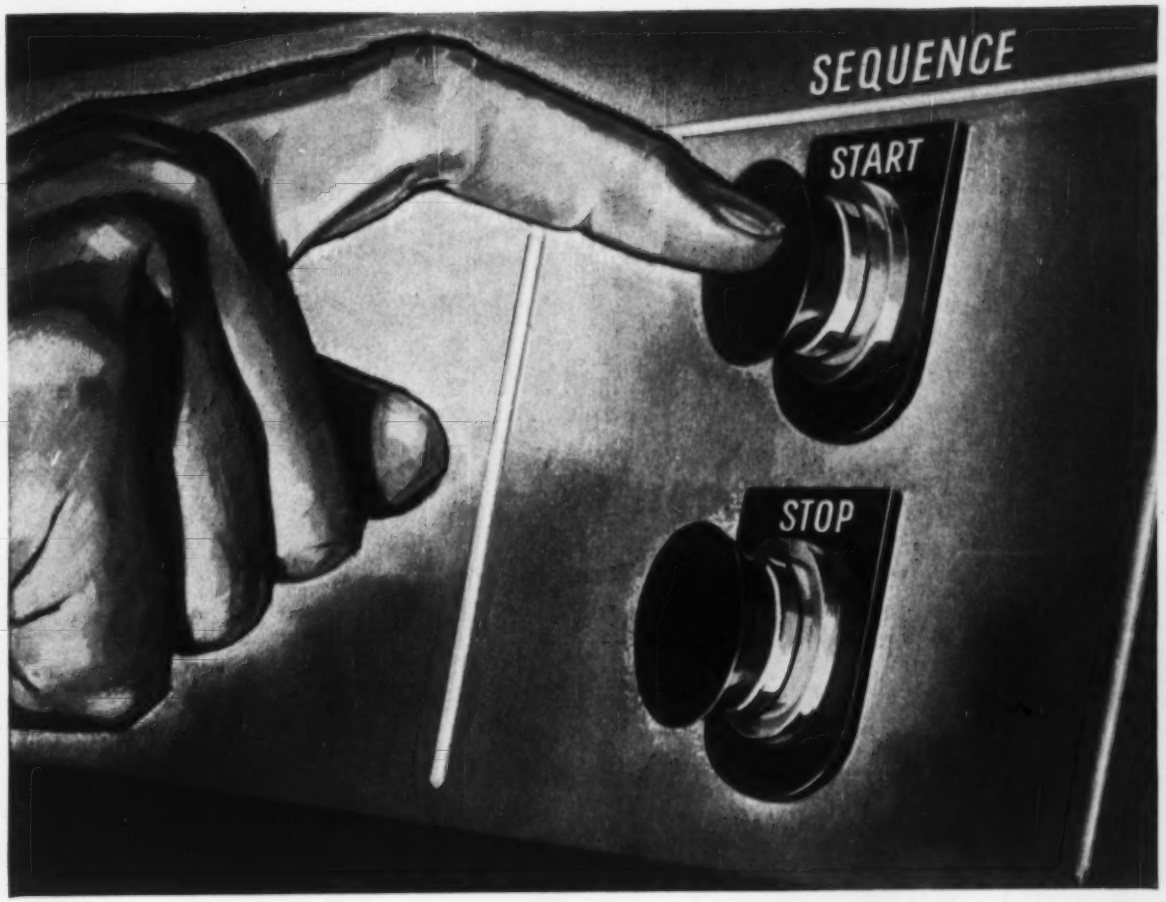
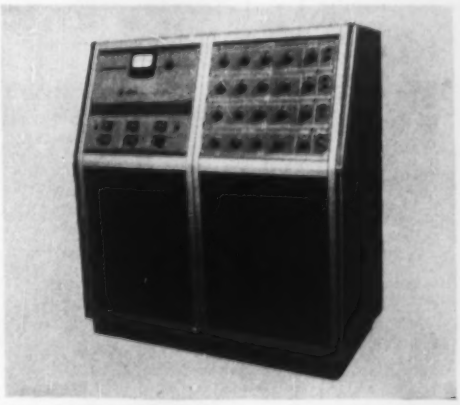


Batch electronically with Batchetron!

Here's what it will do. Operating electronically from a remote control station, the Fairbanks-Morse Batchetron can be preset with knobs and buttons to accurately control your asphalt batching from any one or more bins or tanks. The cycle of mix is also preset, and the actual batching takes place at the touch of a button.

Which of these features will improve your batching operation? Do you want remote control—for instance, batching from an air-conditioned office? Do you want the fast programming feature—for the occasional single batch from a different formula? Do you want the automatic cycling—that will duplicate the batch again and again at the touch of a button?

The Batchetron is . . . Fairbanks-Morse electronics instrumentation plus accurate weighing in the Fairbanks-Morse tradition. There is a new bulletin, No. ED-14, on the Batchetron with many suggested applications which may fit your operations. Send for it today. Fairbanks, Morse & Co., Dept. ENR-117, 600 South Michigan Ave., Chicago 5, Illinois.



Batchetron control console.

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a name worth remembering when you want the BEST

SCALES • PUMPS • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • MOWERS • MAGNETOS

10,200 tons of NATIONAL SEAMLESS

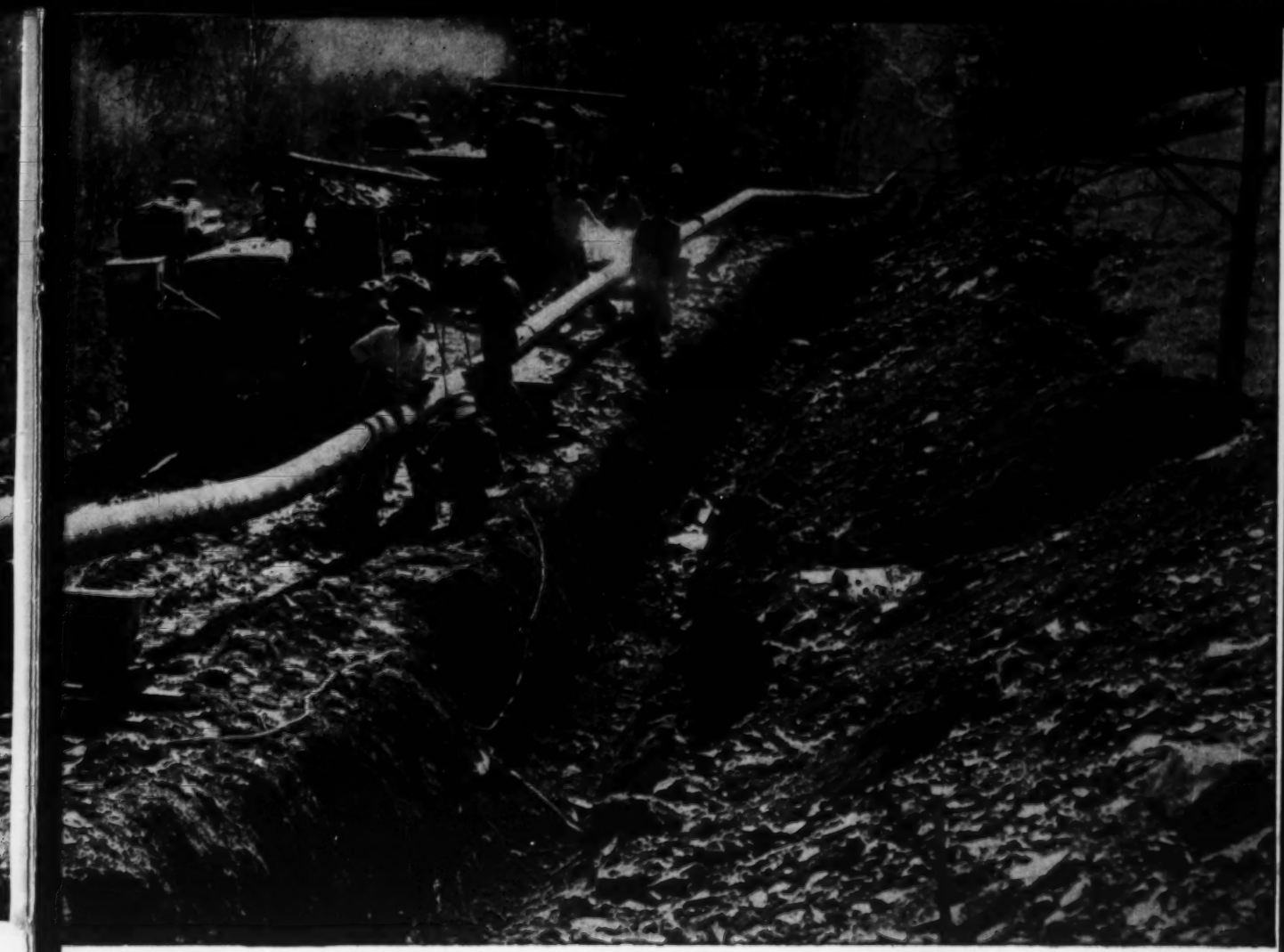
used in World's

Coating and wrapping National Seamless Pipe prior to lowering in.

Stringer bead welders near Cadiz, Ohio.

WALLS WITHOUT WELDS

NATIONAL SEAMLESS PIPE AND TUBES



first Coal Pipeline

A unique, $10 million, 10¾" O.D. pipeline is presently under construction for Pittsburgh Consolidation Coal Company. It will run from the Cadiz, Ohio area to the Cleveland Electric Illuminating Company's East Lake, Ohio, plant. Plans call for the line to carry 1,200,000 tons of coal a year. The coal is to be pulverized, mixed with water and pumped as a slurry to its destination. It will then be dried and processed prior to delivery to the consumer.

National Seamless Pipe is especially suited to rugged service such as this because of its strength, uniformity and flexibility. National Seamless is the pipe chosen consistently by engineers for every kind of pipeline. It gives long, dependable, trouble-free service. Specify National Seamless "Walls Without Welds" for your next job.

NATIONAL TUBE DIVISION
UNITED STATES STEEL CORPORATION, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

In Pipelines Too . . . Seamless Does It Better

USS

UNITED STATES STEEL

Concrete treated with Columbia Calcium Chloride speeds construction schedules, makes stronger concrete faster, permits earlier form removal, helps to eliminate costly night finishing.

Your concrete is stronger and you save money with COLUMBIA CALCIUM CHLORIDE

By adding Columbia Calcium Chloride to your Ready Mix in cold weather, you get faster set, accelerated early strength. Forms can be removed and re-used days sooner. The whole construction job moves along ahead of schedule.

Here are the specific advantages you get

1. Under normal conditions, the initial set is reduced from 3 hours to 1 hour. The colder the weather, the greater are the effects of Columbia Calcium Chloride.
2. The final set is reduced by the same ratio—from 6 hours to 2 hours.
3. The early strength of concrete cured with Columbia Calcium Chloride is as great in one day as plain concrete is in 2 days. In 3½ days it has the strength equal to untreated concrete of 7 days!
4. The ultimate strength increases substantially. Tests by impartial testing organizations show an increase of 10 percent in 5 years when calcium chloride is used in the mix.
5. Integral curing is improved. Columbia Calcium Chloride establishes favorable conditions for hydration during the setting and hardening period of concrete, despite adverse conditions of low humidity.

Summer and winter, you benefit greatly from Columbia Calcium Chloride in your concrete—the colder the weather the more pronounced are the advantages.

Columbia Calcium Chloride is not an anti-freeze, however, and it should not be considered as such. Normal cold weather protective measures should always be followed, but the addition of calcium chloride greatly reduces the protection time—often from 7 days to 3 days.

Columbia Calcium Chloride may be added to the mix at the plant or on the job site. It is available in REGULAR FLAKE, 77-80%, and the new HIGH TEST FLAKE which runs 95-98%.

For more information, write today to Calcium Chloride Department at our Pittsburgh address.

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 3, 1957
BOOTHS 61-62

COLUMBIA-SOUTHERN CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

DISTRICT OFFICES: Cincinnati • Charlotte • Chicago
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IN CANADA: Standard Chemical Limited and its
Commercial Chemicals Division

Jaeger's all-new

Self-widening Finisher

will be there at

the Road Show

CHASE® helps to create

Architects
Mies van der Rohe and Philip Johnson

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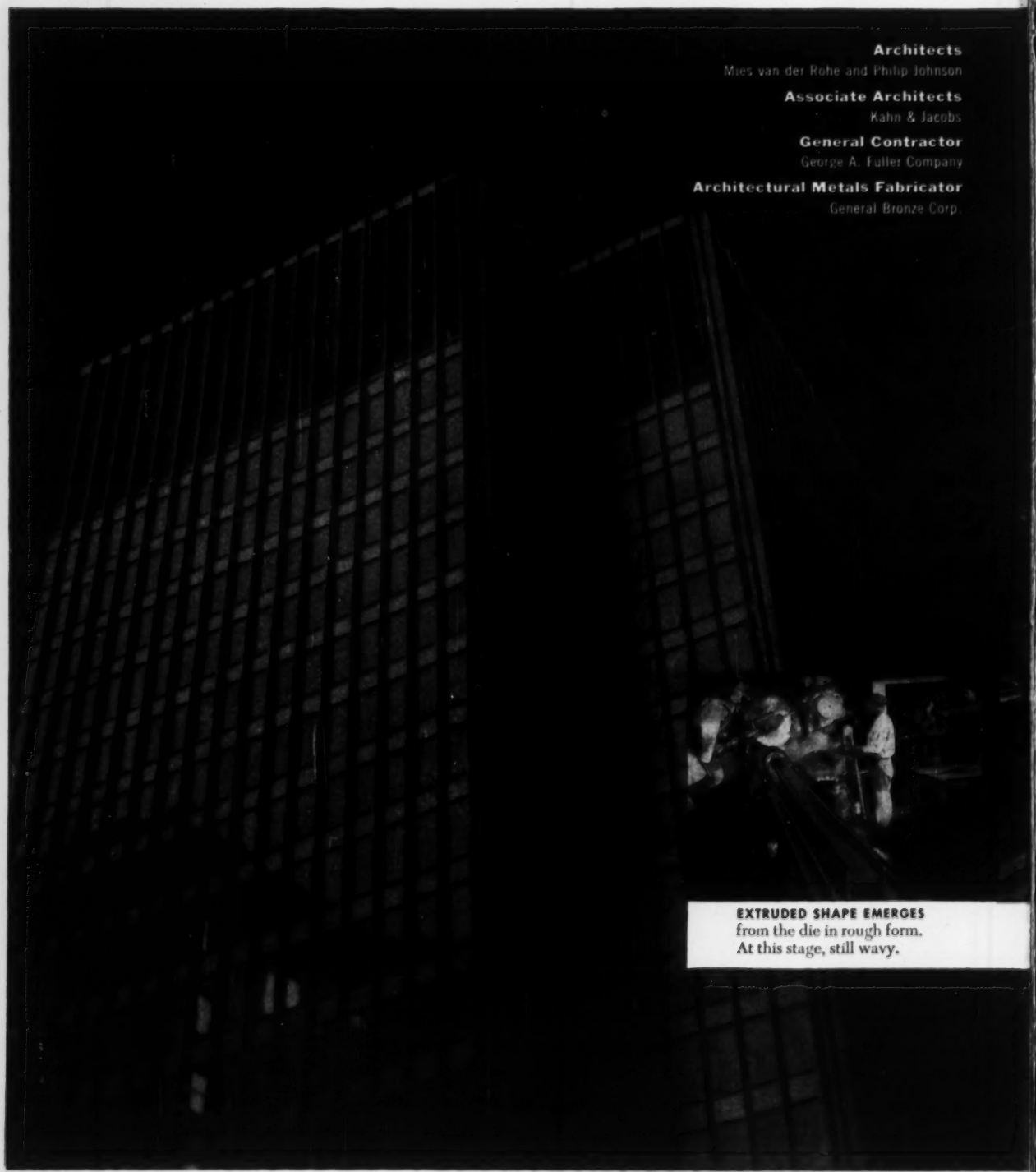
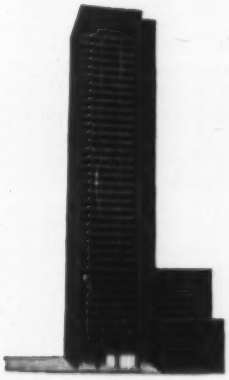
General Bronze Corp.



EXTRUDED SHAPE EMERGES
from the die in rough form.
At this stage, still wavy.

world's first bronze building



HOUSE OF SEAGRAM uses largest bronze shapes ever extruded commercially

The architects had a dream: to give New York's Park Avenue the world's first bronze skyscraper. And Chase engineers helped make it real. Constructing the Seagram Building "Curtain Wall" entailed fabrication of straight, true I lengths larger in diameter than ever considered practical. Chase, working with the architects, the General Bronze Corporation and other mills, played an important part in opening new horizons in design.

WHY BRONZE? Mies van der Rohe and Philip Johnson chose bronze for its nobility, beauty of color and structural flexibility. Moreover, the copper alloy called "Architectural Bronze" has mellowing qualities that will give the building a rich brown *patina* as it ages. Practically speaking, bronze requires a bare minimum of maintenance. But first came construction problems.

WHY CHASE? Technical "know-how" plus the most modern facilities eminently qualified Chase for its share of the job. Many of the specially-designed extrusions that make up the bronze facade are historical "firsts." Chase made valuable contributions to the engineering and modification of these shapes—as well as to the production of them. Perhaps you, too, have an architectural dream... *Chase is at your service.*

STRAIGHTENING PROCESS involves drawing shape through a second die.

PAINSTAKING HAND WORK assures that dimensions are micrometer-perfect.

QUALITY CHECK is made at factory of four shapes produced by Chase.

CAREFUL PACKAGING makes sure shapes reach building in flawless condition.

Chase BRASS & COPPER CO.

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The Nation's Headquarters for Brass, Copper and Stainless Steel

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Elastizell®

. . . the perfect answer to the residential slab-on-grade problem!

Parquet wood flooring on Elastizell-type concrete slab

Concrete made with this material is . . .

• HIGHLY MOISTURE-RESISTANT

Elastizell-type slab is dry. On it can be used any kind of floor covering—cork or rubber tile, linoleum, parquet-type wood flooring, wall-to-wall carpeting!

• SELF-INSULATING

Elastizell-type slab, with its "warm-to-the-touch" feel, permits maximum performance of whatever the heating system. Hence, floor-to-ceiling living comfort!

AMONG OTHER USES OF ELASTIZELL-TYPE CONCRETE . . .

- as light weight, easy-to-handle floor fills in multi-storied construction.
- as light weight, insulating roof fills.
- as light weight structural members.
- as insulation for underground pipe lines.
- as precast slabs and panels.

Write, wire or phone . . .

ELASTIZELL CORPORATION OF AMERICA
158 FLETCHER STREET • ALPENA, MICHIGAN
'PHONE 1080

Reader Comment

Already Unanimous—Almost

SIR—Re your item (ENR Dec. 20, 1956, p. 15) which stated that a committee now at work seeks to make Montana the 48th state to have an engineers' registration law:

Montana now has a license law passed in 1947 covering only civil engineers and land surveyors. A proposed new law to be presented to the legislature will cover all engineers.

WILLIAM J. WENZEL
Consulting Engineer
Great Falls, Mont.

Old Friends

Letters from readers who have known Engineering News-Record longer than any member of its present staff come to us now and then. The sadness which time's inevitable toll thus brings is lessened by the gratitude we feel for their long interest and readership, which we thankfully acknowledge. Two such letters follow:

SIR—The controlling factor of our lives is not always what we want or wish, but it is what we must do. Your records should show that I first subscribed for Engineering-News in 1907, and I have been a constant subscriber and reader of it ever since that date. The time has come when I must be satisfied in sitting down and doing nothing. I always used ENGINEERING NEWS-RECORD to keep in touch with engineering practice and work, and it served me well. After 50 years in active engineering work, of which 34 years was in operating my own consulting engineering office at Lincoln, Nebraska, I come now to sit back and try to be satisfied to let the younger engineers carry on.

Not having ENR come to my desk every week will be like missing an old and tried friend.

E. HERBERT DUNMIRE
Consulting Engineer
Lincoln, Neb.

•

SIR—I will soon be in my 90th year on this earth. I am telling you this to explain and give a reason for discontinuing my subscription to ENGINEERING NEWS-RECORD. I do very little reading on account of my eyes.

Thank you again for the 1956 "Construction Costs & Price Trends," which I have always appreciated, having had about 30 years experience on railroad construction and maintenance and 22 years with the Bureau of Valuation, Interstate Commerce Commission.

Lots of good wishes for ENR.

FRANK B. SCHEETZ
Washington, D. C.

Concrete, Not Cement

SIR—We frequently read articles in the newspapers in which they refer to "cement" highways, "cement" buildings, ready-mix "cement" trucks, in describing concrete structures or equipment used in mixing or handling concrete.

Engineers and construction people should challenge such incorrect language whenever it appears. Just point out that "cement" is an ingredient of concrete just as flour is an ingredient of bread. We do not say a loaf of "flour", or a slice of "flour."

A. R. WATERS
The Carter-Waters Corp.
Kansas City, Mo.

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

CALENDAR

Engineers Joint Council, Third Annual Assembly, Jan. 17-18, with Assembly Dinner evening of 17th. Reservations: EJC, 29 W. 39 St., N.Y.C. Place: Hotel Statler, N.Y.C.

National Association of Home Builders, annual convention and exposition, Hotel Sherman, Hotel Conrad Hilton and Coliseum, Chicago, Ill., Jan. 20-24.

Associated Equipment Distributors, 38th annual meeting, Conrad Hilton Hotel, Chicago, Jan. 27-30.

American Road Builders Association, annual meeting and road show, Chicago Amphitheater, Jan. 28-Feb. 2.

Reinforced Plastics Div., Society of the Plastics Industry, Inc., 12th Annual Technical and Management Conference, Edgewater Beach Hotel, Chicago, Ill., Feb. 5-7.

Eastern Snow Conference, 14th annual meeting, Onondaga Hotel, Syracuse, N. Y., Feb. 7-8.

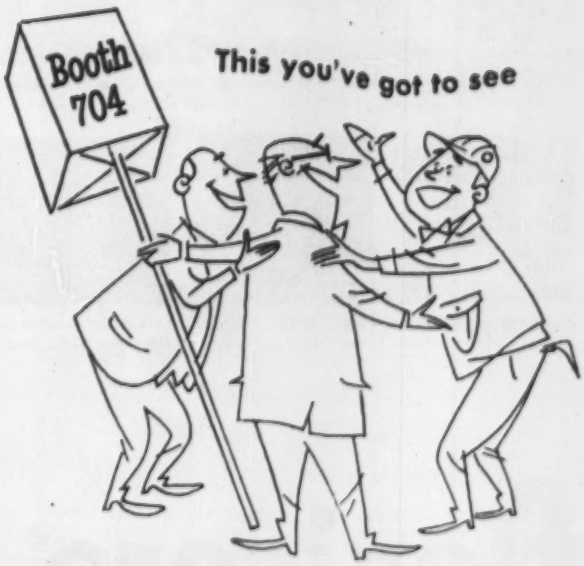
American Concrete Institute, 53rd annual convention, Statler-Hilton Hotel, Dallas, Tex., Feb. 25-28.

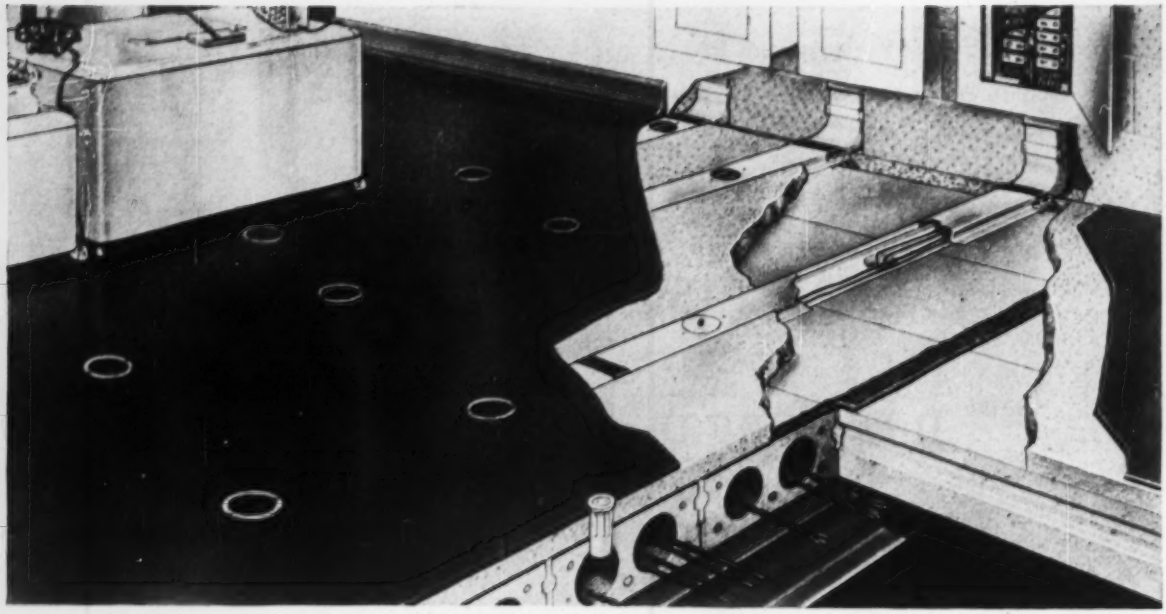
Not just one but two great

new Jaeger Aggregate Spreaders

to 16′ width, to 16″ thickness

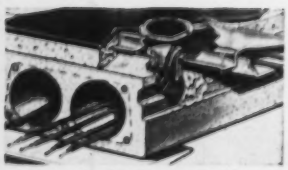
waiting for you at the Road Show



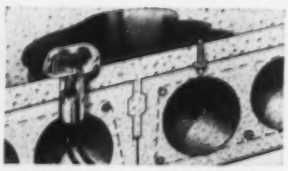


Hollow cells in concrete floor are electrical raceways. Cells are electrified by header ducts which run from panel box across floor at right angles to the cells. Floor outlets install at any point along cell.

Now! Electrical Availability



Wiring drops from header duct into cell at handhole junction.



Wiring then runs either way through cell to floor outlet.

To install outlet: drill hole at outlet location.

Next, install fitting in floor and fish wire.

Last, attach electric or telephone outlet box.

Gives Unlimited Distribution

The hollow cells in a Flexicore precast concrete floor become approved electrical raceways with this new underfloor distribution system. The cells are large circular voids, spaced 5⅓″ or 8″ on centers, depending on the Flexicore unit selected. Standard header duct is 4″ wide and installs directly on the precast floor. A concrete fill, usually 1½″, is leveled to the top of the header duct. Finish floor conceals the header. Handhole junction cover plates give access to the system at the intersection of header and cell.

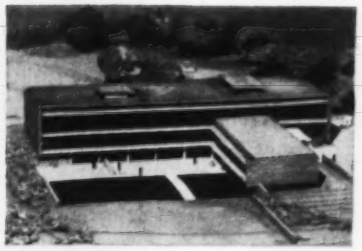
Floor outlets install quickly at any point along a cell, giving unlimited electrical availability. Any number of systems can be used: electrical, telephone, intercom, and any others desired.

The use of this system is covered by Article 358 of the 1956 National Electrical Code. Electrical fittings are manufactured by the Conduflor Corporation, Cleveland, Ohio.

flexicore® ELECTRIFIED FLOORS

with Conduflor® Electrical Fittings

OFFICE BUILDING MANUAL
Flexicore Electrified Floors
New 32-page booklet available to architects, engineers and contractors. Write nearest manufacturer for your copy.



Wisconsin Farm Bureau Building Cooperative office building, Madison, Wisconsin. John J. Flad & Associates, architects. Berman Electric Company, electrical contractor.

Continental Casualty Building, Toronto. Marani & Morris, architects. H. H. Angus and Associates, mechanical and electrical engineers. Canadian Comstock Co., Ltd., electrical contractor.

National Cash Register Engr. Research Bldg., Dayton. Lorenz & Williams, architects. Schweiger, Heapy & Assoc., consulting mechanical engrs. Wagner-Smith Co., elect. contr.

Erection of Flexicore concrete structural floors is fast on steel frame, above, or on concrete frame or masonry walls.

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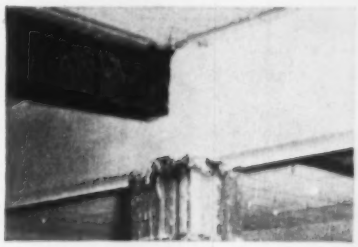


Structural concrete floor requires no extra fireproof ceiling. Columns, girders and beams get usual fireproofing treatment.

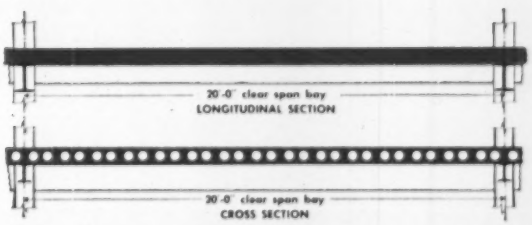
in Flexicore Precast Floors

Needs No Fireproofing

The structural floor of this system is formed of monolithically cast Flexicore concrete units, and requires no fireproofing. Underwriters Laboratories gives a 3-hour fire rating to an 8″ Flexicore floor with 1½″ concrete topping.

The basic advantages of this system for office building construction include savings in job time and investment. The dry erection of the lightweight units saves construction time. Less structural framing is required because of long, clear spans. Plaster fireproofing on the underside of the floor is eliminated and concrete topping is reduced in thickness to 1½″ because of the fire-resistant qualities of the structural floor itself. As a by-product of these savings, overall job time is reduced, providing earlier occupancy.

The Flexicore method is a time-tested system and has been used on over 24,000 buildings in the United States and Canada.



LONG SPANS SIMPLIFY STRUCTURAL DESIGN

The use of Flexicore precast concrete floors in office buildings permits 20′ x 20′ clear span bays. This means simple framing without intermediate beams, and results in savings in steel and in total weight. The new Flexicore Office Building Manual contains design information, including properties of the Flexicore slab, load curves, special design conditions and design examples.

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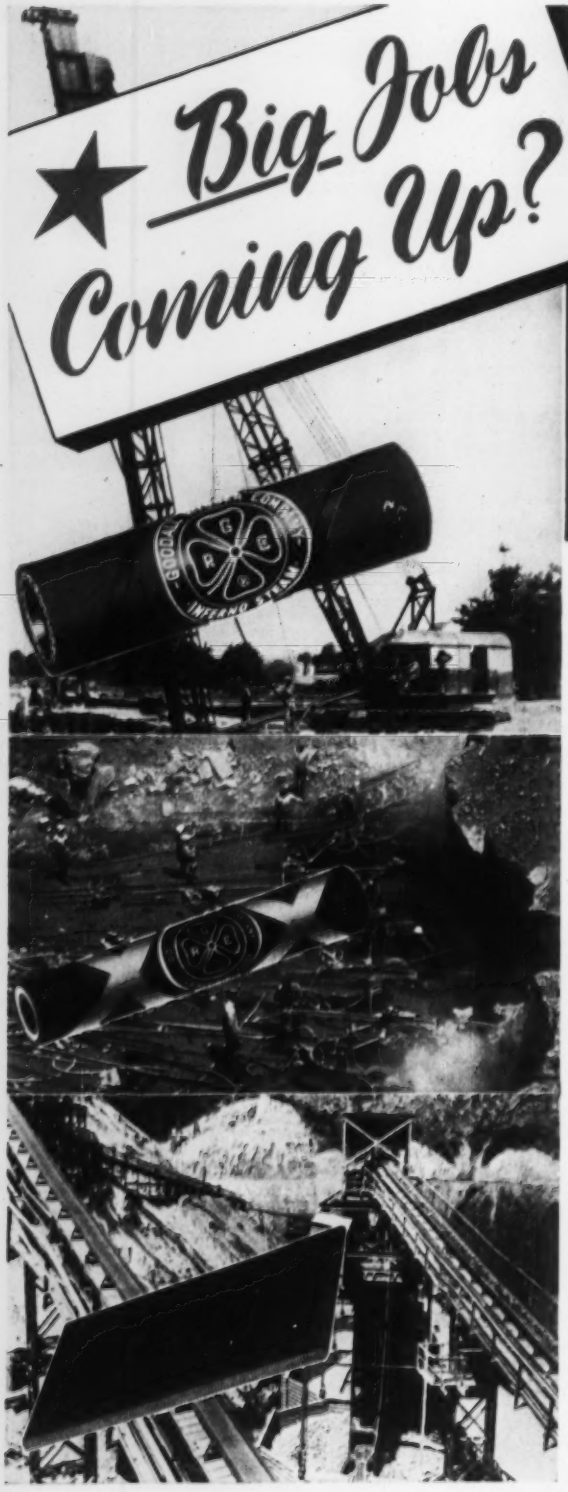

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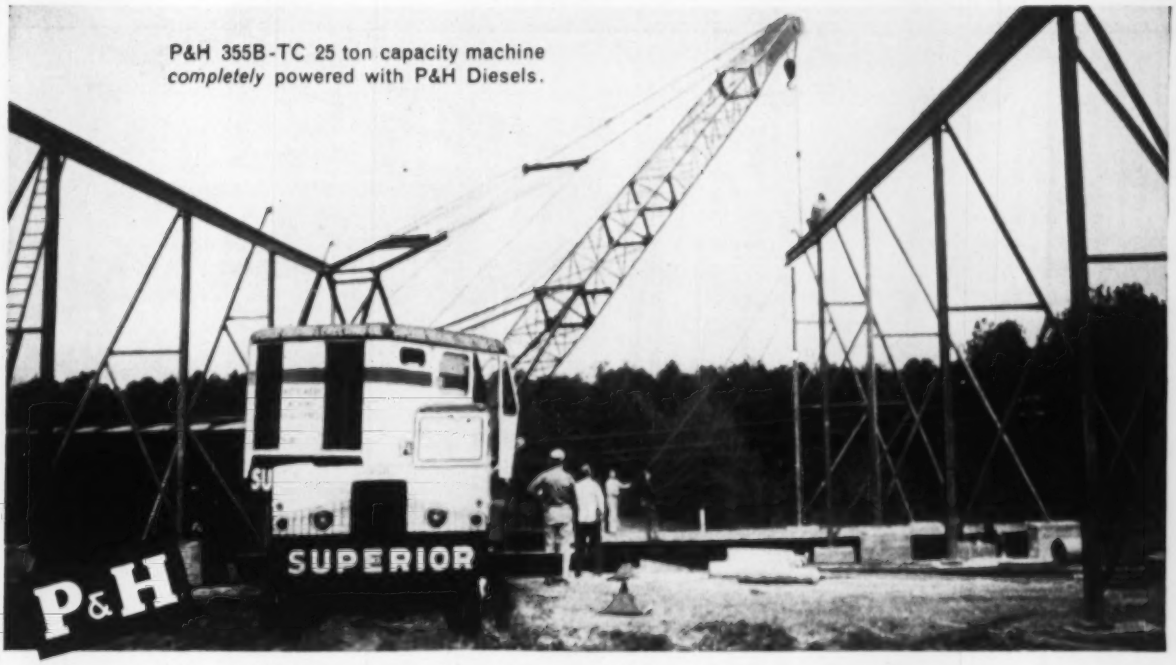

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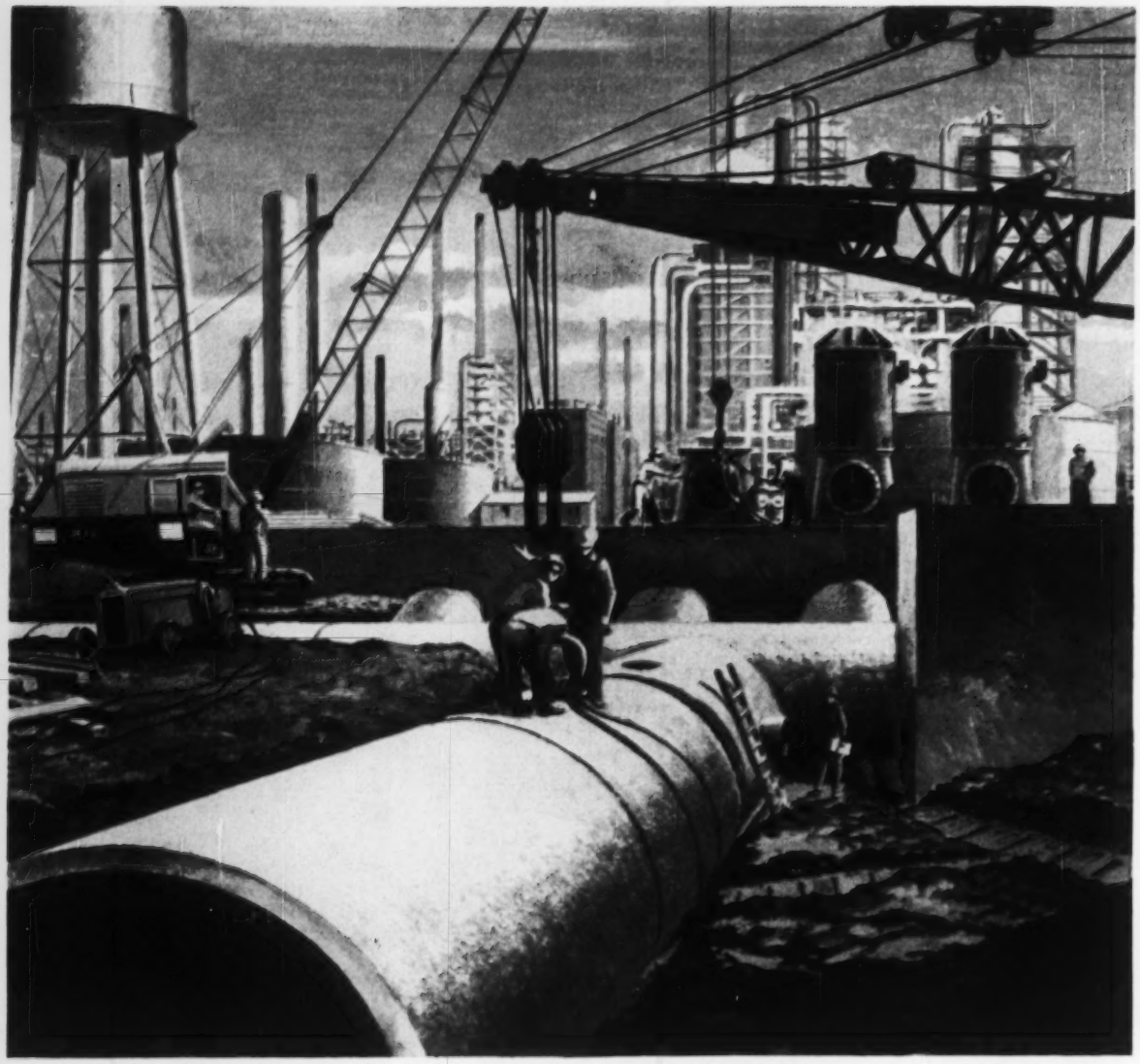

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It takes a staggering amount of water to run an oil refinery such as the one recently built for the Tidewater Oil Co. at Delaware City, Delaware. Specifications required twin 78" LOCK JOINT REINFORCED CONCRETE CYLINDER PIPE-LINES to supply water to this plant. The combined capacities of these two lines would satisfy the normal requirements of a city of over two million population.

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THE CONSTRUCTION WEEK

DROUGHT SURVEY STARTS—President Eisenhower's tour to six drought-ridden states started this week with San Angelo, Tex., the first stop. In San Angelo a Bureau of Reclamation booklet describing how to solve the Texas water problem by spending a billion dollars was dusted off for presentation to the Presidential party. And in Wichita, Kan., as the flying tour came to an end on Tuesday, a study group of ranchers and farmers from 10 Plains states were set to give the President and his troupe of advisors the results of their deliberations. Presidential advisors who went along on the trip were a first string group, including Agriculture Secretary Benson, Interior Secretary Seaton, Commissioner of Reclamation McClellan, Chief of Engineers Itschner, and the White House advisor on public works, J. S. Bragdon. A proposal on how to ease conditions in the seriously affected drought areas is sure to be an outcome of the survey.

HIGH COST OF FROSTING—The Alaska District of the Corps of Engineers is going to spend $210,000 to replace 1,900 steel windows with double-hung wood-frame windows and storm sash in barracks at two subarctic Air Force bases. The reason: Frost builds up so heavily on the steel in subzero weather that the windows are rendered useless for illuminating purposes.

AIA ANNOUNCES CENTENNIAL PLANS—President Eisenhower heads the list of prominent persons invited to speak at the centennial celebration of the American Institute of Architects in Washington next May. If he accepts, he will be following a precedent set by President Theodore Roosevelt, who spoke at the AIA's 50th-anniversary convention in 1907.

The four-day program, devoted to a forum on planning the environment of the future, will be part of a national observance, with the theme, "A New Century Beckons." The 100th anniversary will also be marked by an architectural exhibition at the National Gallery of Art and a commemorative 3-cent stamp issue by the Post Office Department.

PRICE-FIXING CHARGED—When the Milwaukee County (Wis.) Park Board discovered in 1954 that it had received identical bids from calcium chloride producers for 21 years, it turned its suspicions over to the State Attorney General. After a three-year investigation, the Attorney General's office deciding that it, too, was suspicious, promptly filed a price-fixing suit against five national producers and nine local suppliers.

ALUMINUM BRIDGES—Slow steel deliveries moved the Iowa State Highway Commission last week to authorize a research project aimed at determining whether aluminum is a satisfactory substitute for steel in bridge construction. According to some estimates, the switch might hike the cost of a bridge by 70%.

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WASHINGTON OBSERVER

Eisenhower's construction budget is good news: It's up—and big—right across the board. Public works of all kinds are affected: highways, water resources and other civilian projects. Military public works will be supported by bigger federal spending in fiscal 1958 (beginning July 1) than in fiscal 1957 (ending June 30).

All told, the budget out this week shows that 7.5% of all construction is financed directly by federal dollars—and federally aided state and local projects account for another 5.5%.

•

Total spending for public works goes up 28% next year compared with this fiscal year—from $4.9 billion to $6.3 billion. Most of this increased business for construction is sure-fire, and not dependent on new requests that Congress has to act on. The increase goes for projects already under way, and for which Congress is committed to voting the needed funds.

Civil public works spending will increase 50% next year over this: up from $2.5 billion to $3.7 billion. The Bureau of Public Roads trust fund spending, for instance, is showing a 45% rise: from an estimated $1.1 billion this year to $1.6 billion. Water resources projects will go up to $976 million from $786 million, or about 25%.

Military public works will go up about 15% from this year's $2 billion to an estimated $2.3 billion.

•

Spending next year on work already started will run $1.5 billion with an estimated $6.2 billion needed to complete these projects. Expenditures for construction needing authorization by Congress will—if enacted—result in spending in fiscal 1958 of $405 million, with $1.6 billion needed to complete these. The proposed school construction program is the biggest single item here; it's the same program as Eisenhower proposed last year.

•

Backlog of planned projects keeps going up, too. All told, it's estimated that some $12.3 billion of unstarted construction work has been authorized either specifically, or by general legislation.

About $8 billion of these projects are for the Corps of the Engineers and the Bureau of Reclamation, representing 618 projects, all told. The Engineers estimate their part of the backlog at $5.2 billion, Reclamation has $2.8 billion.

By the end of '57, $1.7 billion of this work was planned to the stage where construction could be started; but a year from now, it's estimated that $3.4 billion in projects will be planned to this point. An additional $4.7 billion of projects is now in various stages of advance planning; a year from now, about $3.8 billion will be in some stage of advance planning.

•

Not all programs are on the increase however. Looking through the budget message, you'll find some declines ahead:

Veterans' programs, for example, will show a drop during fiscal '58. Hospitals and other facilities which are getting $46 million this year will decline to $36.6 million next year.

Parkways, roads, and facilities in national parks will drop from this year's $52 million to $47.8 million. But forest roads and other structures will increase from $30 million to $42 million.

NEW USE FOR GRATING -- SUN SHADES FOR MODERN SCHOOLS

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Building a Better World—At a Profit

One of the world's largest lenders for construction last week did some borrowing.

The International Bank for Reconstruction and Development, popularly known as the World Bank, sold a $100-million bond issue in the U. S. money market to bolster the supply of cash it will need for construction loan disbursements in 1957.

With this $100 million and $50 million received less than three weeks ago as a direct loan from the Swiss government, the World Bank will be able to continue its role as a developer of underdeveloped nations.

U. S. engineers, contractors and suppliers—and their international counterparts—have a big stake in this unique institution.

Because there is a World Bank, construction men from the United States, the United Kingdom, France, Germany, Italy and other countries are at work all over the globe, building highways, electric power plants, dams, cement plants, steel mills, railroads, docks, and other projects.

Because of the World Bank, Morrison-Knudsen is building a cement plant in Indonesia; H. K. Ferguson is building a water intake pipeline in Managua, Nicaragua, in connection with a 30,000-kw electric power plant; and a four-year road construction program in Ecuador is being carried out through joint efforts of an American engineering firm, Michael Baker, Jr., and Ecuadorian and German contractors and laborers. There are many other projects—and U. S. firms are participating on a large scale.

While neither the United States nor any other single nation gets a dominant share of the bank-generated business, the U. S. is one of the moving forces in the operation. What, then, is the World Bank? And how did it get started?

• **Birth of a dream**—The World Bank was conceived in 1944 at a major economic conference at Bretton Woods, New Hampshire, attended by representatives of 44 nations.

Its initial purpose was to facilitate "the restoration of the economies destroyed or disrupted by war," and then "to encourage the development of productive facilities and resources in less-developed countries."

Sixty nations now comprise the Bank's membership. Each has a voting share proportional to the amount of capital subscribed.

All bank members (including the underdeveloped nations) subscribe capital and pledge subscriptions. Only 2% of each nation's subscription is in gold or dollars; 18% is in the member nation's own currency and the balance is pledged.

With these pledges, the bank sells bonds to finance its projects. Loans are limited to member governments and to enterprises guaranteed by member governments.

That's where the money comes from. Where does it go? Following World War II, World Bank loans to European nations helped pay for agricultural and industrial machinery, electric power installations, new railroad lines, lumber and coal.

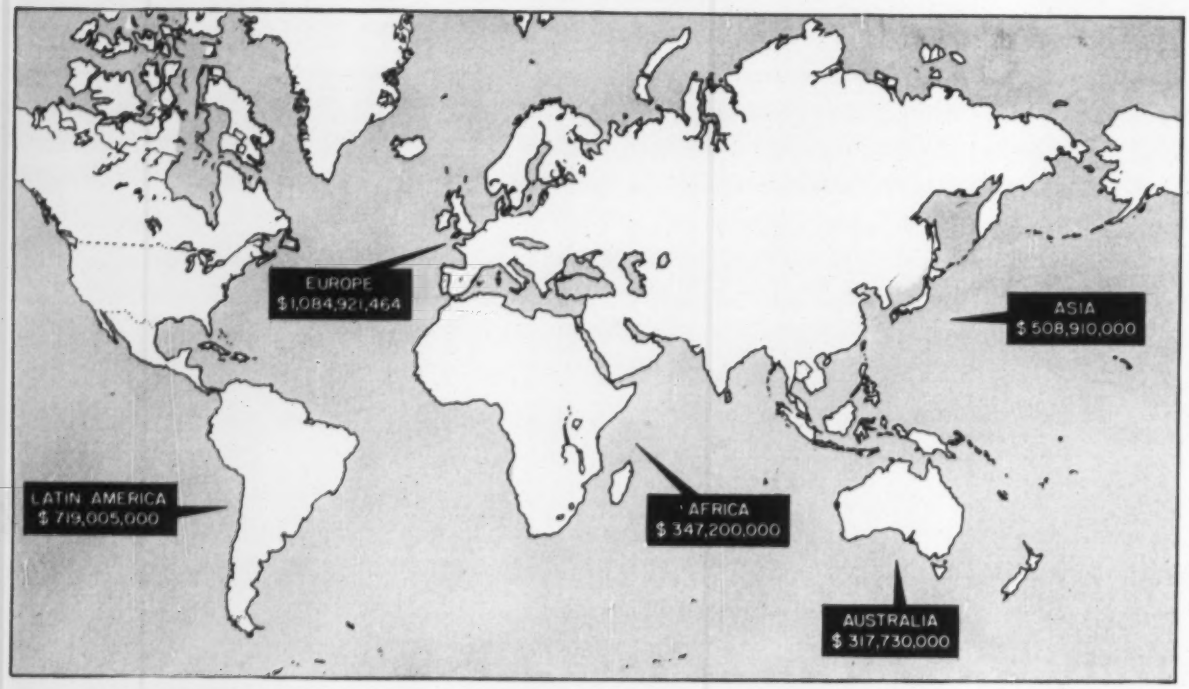
With the arrival of the Marshall Plan for Europe in 1948, the bank was able to turn its attention to economic development of the have-not areas.

The challenge was—and still is—enormous. Two-thirds of the world limped along with primitive economies. In Italy, Africa, India, Latin America and elsewhere money was needed for economic development—and the World Bank was ready to provide it.

• **Basic services**—It became evident quickly that construction would be needed on a large scale. Providing a nation with agricultural machinery, for example, increased output at the farm. But then highways are needed to transport the produce to market. A construction need was created. Industrial equipment was urgently required in some areas but it was virtually useless without an adequate supply of electric power. Another construction need had developed.

Because underdeveloped nations so often are lacking in these basic services, more than one-half of the World Bank

World Bank's Loans Pave Way for Progress . . .



MAP SHOWS HOW $1.978 billion in World Bank loans were allocated as of Dec. 31, 1956.

loans have been used for improvement of power supply, and transportation facilities.

The remainder has gone for postwar construction loans, industry, agriculture, and other development programs. (Suppliers have done well; two-thirds of the bank's disbursements have gone for goods purchased in North America.)

Again and again, these World Bank loans have opened vast new markets for construction. Thanks to the World Bank, Africa is beginning to emerge as a land of vast resources and potential. Transport and electric power, communications, port facilities, agricultural developments and industries now are springing up throughout this vast continent.

To provide needed electric power for Southern Rhodesia, for example, the bank made a loan of $28 million in 1952. With the additional generating capacity, the area's electric power has doubled and there are almost twice as many industrial plants in the colony as there were just 10 years ago.

And, last June, the bank loaned $80 million to finance the start of a large power development project in Rhodesia. This project will supply 1.2 million kw of power for Northern Rhodesia's booming copper mines and will supply power also to surrounding communities.

Sometimes the aid sought from the World Bank is not related to industrialization but is vital nevertheless. An example is the $45-million flood control project for Baghdad, threatened annually by floods. A new completed project protects the city which as recently as 1954 suffered a flood whose damage exceeded the entire cost of the flood control project.

In other cases, industrialization is one phase of a broad, overall development. India, for example, has been compiling estimates of its future needs for outside capital. Reports say that when World Bank investigators reach New Delhi this month, they will be confronted with a list of needs totaling more than $1 billion.

Since gaining independence in 1947, India has launched enormous programs to raise the standard of living. Construction programs are under way for electric power development, flood control and irrigation.

Three mighty dams that eventually will reclaim more than 1 million acres of wasteland have been built on the Damodar River, in India's most important industrial area—with World Bank aid. Americans are much in evidence. Ebasco Services was the consultant for a 125,000-kw powerhouse that went into operation last month near Bombay.

Kaiser Engineers is assisting in part of an expansion program that will increase to 2 million tons the capacity of the Tata Iron and Steel Works at Jamshedpur. And, just last month, the World Bank announced a new loan of $20 million for further expansion of Indian steel production. India now has received a total of $75 million just for this type of expansion alone.

While the Middle East and Far East loans are substantial, Europe is not neglected. In fact, Europe last year was the largest recipient of World Bank loans, receiving a total of $145.6 million.

More than half of the money channeled to Europe went for agricultural and industrial development of Southern Italy, to continue a massive 12-year program started in 1950.

Core of the plan is a large public works program aimed at improvement of agriculture. So far, 1,000 miles of canals have been improved; 114,000 acres of land have been placed under irrigation; 1,300 miles of new roads have been constructed and another 5,600 miles of roads have been improved. And, new water supplies have been provided for 245 villages with a total population of more than 1.3 million.

• **To help them help themselves**—While the loans are essential, careful planning and realistic goals are equally important ingredients in economic development.

To help governments work out effective programs for future growth, the World Bank established economic survey missions—teams of experts who help a country work out a general program,

. . . Free Enterprise

in which the entire economy is analyzed.

Such studies are likely to include population trends, basic skills, public policies, investment trends and general needs of the people. World Bank experts may offer advice on ways to stimulate the inflow of foreign capital, ways to eliminate internal obstacles, and regional development problems.

Suggestions may include specific industrial projects, agricultural growth, highway programs, investment programs, changes in federal policies.

Since 1949, some 21 nations have received such planning assistance.

Rarely are the recommendations of a World Bank mission accepted in toto. Nevertheless, the bank's advisory missions can boast of a proud record of accomplishments.

Among these achievements are: a highway program in Colombia, encompassing all major roads (a total of 2,000 miles) is under way; hydroelectric plants are slated for three fast-growing industrial and agricultural centers and agricultural production is being vastly expanded.

Other results: adoption of federal and regional development programs in Nigeria, preparation of a five-year investment program for Guatemala, railway rehabilitation in Jamaica, a highway program in Honduras and many others.

In addition to general survey missions, the World Bank also will provide assistance on specific development problems. Last year, bank experts visited Pakistan to discuss establishment of a privately-owned industrial credit and development company. They made an analysis of Mexico's future power needs and the means available to finance such construction. In Japan, advice was given on land reclamation. In Uruguay, ways of strengthening the capital market were discussed.

• **Principal and interest**—The humanitarian side of the World Bank's activities becomes readily apparent. But even though its loans and services benefit mankind, the World Bank is by no means a philanthropic organization. Its investments make money.

For the fiscal year ended June 30, 1956, the World Bank's net income reached a record $33 million.

Equally remarkable is that as of Dec. 31, 1956, the World Bank had loaned a total of $2,978 billion—without a single default of principal or interest on any of its loans.

There is good reason for this. The World Bank makes loans carefully.

Feasibility of a project from an engineering and construction viewpoint is not sufficient to win World Bank approval for a loan. The bank also considers suitability of the project to its particular environment, stability of the economy, the government's attitude toward private enterprise and general economic and fiscal policies.

Each project for which bank funds are sought is thoroughly investigated. The bank will not support any government ventures into an industry for which private capital can be found. Neither will the bank finance the entire cost of a project. The nation that is borrowing must make a substantial investment. It usually provides (or obtains from private sources) funds needed for local materials and equipment purchases or for the hiring of local labor.

One reason that such prudence is expected from the bank is that many proposals are brought to the bank in vague form. Others need additional study or revision. One nation, for example, recently asked the bank for a loan to purchase railroad locomotives. But, when the bank investigated, it discovered the new locomotives would be much too heavy for the bridges they were supposed to cross. In this case, the borrower was fortunate—it received money both for new locomotives and stronger bridges.

Eugene R. Black, tall, affable, 59-year-old president of the World Bank, is a much-traveled, financial expert who has been described as one of capitalism's most articulate and energetic salesmen.

Atlanta-born, Black learned his financial ABC's at an early age (his father was a lawyer, banker and a governor of the Federal Reserve Board). He put his knowledge at work first as a financial cub on the Atlanta Constitution, later as a top-notch salesman for the Manhattan brokerage firm of Harris, Forbes & Co. (Black spent 14 years with this company traveling through the South, selling bonds. His specialty: foreign bond issues.)

When New York's giant Chase National Bank (now Chase Manhattan) absorbed Harris, Forbes, Black went along. By the time he left to go to the World Bank, he was a Chase vice-president in charge of the bank's $2-billion investment portfolio.

As the World Bank's third president (the first was Washington Post Publisher Eugene Meyer; the second, John J. McCloy, former U. S. high commissioner for Germany), banker Black set out to spread capitalism, which he feels is the best way for underdeveloped nations to realize their potential. His success is making it possible for U. S. engineers, contractors and suppliers to join with other construction men from all parts of the globe in building a better world—at a profit.

• **Filling the gap**—The World Bank already has established its worth. Now, many nations are trying to gauge the future of a World Bank offshoot, the International Finance Corporation, established last July.

IFC was created to fill the gap between private investors and the World Bank. Unlike the bank, whose investments are limited to publicly-supported enterprises, the IFC will lend money to finance productive private enterprise without any governmental backing.

Like its parent, IFC will concentrate its investments in the underdeveloped areas of the world. It will provide only part of the capital needed for each industrial venture; industry is expected to put up the rest.

By acting as a clearing house in bringing together investment opportunities and private capital, and by helping to enlist managerial skills for projects, IFC will have a strong influence on the world capital market. It is expected to encourage private investors who would be reluctant otherwise to loan funds for projects in the underdeveloped areas.

IFC already has received $78 million in subscriptions from 32 nations. It has not yet made any investments, although several now are under consideration.

One factor likely to hinder private investments is the extreme nationalism now rampant in some of the underdeveloped areas.

"No leader of a developing country," said World Bank President Black, "can afford to set unrealistic goals and then disrupt the whole economy by trying to achieve them."

The bank will not play under those conditions. But, where the needs are real, the goals realistic and the rulers reasonable, the World Bank will be dealing. The result will be a good stake for construction all over the world—and U. S. engineers, contractors and suppliers have a good chance of getting some of the chips.

Congress

Having authorized the biggest plan in history, U.S. lawmakers want to know whether progress is fast enough; how much mileage should be added to the interstate system; more details on limited access, as . . .

INSIDE THE DOOR lies the fate of the $100-billion highway program, as Senate committee probes progress, need for new legislation.

Congress hauled the nation's big $33-billion highway program up for inspection last week, and in a four-day session gave it the most complete airing the measure has had to date.

Outcome of the hearings is that there will be deeper Congressional looks taken at many parts of the program within the next few weeks.

The idea is to leave time to work through legislation to amend the 1956 Highway Act this session if it appears to be needed.

- A move to authorize more interstate mileage this year seems to be a sure bet.
- The Democrats are sure to revive their plan to have a three-man commission run the program.
- Complaints of contractors on wage determinations by the Department of Labor will get a hearing.
- Steel shortage complaints will bring both supplier and contractors to Washington for an accounting of the supply-demand situation.

On all these matters, the congressmen and senators haven't yet drawn lines on party grounds. But there will be an increasingly political coloration to the highway developments as time goes on:

Some legislators will find themselves politically committed to getting more mileage for their states; others will have a prime interest in giving their constituents what they want in deciding border-line cases left in the specifications laid down for federal officials to administer.

The tollroad compensation issue wasn't touched last week, but is bound to show before the year is out.

In fact, the Congressional committees are going to investigate the program clear back to the policy of deciding such things as by-passing a given town and city, spacing of access roads, and the like.

In the first of a series of Congressional hearings shaping up over the highway program, the Senate public works subcommittee on roads headed by Senator Albert Gore called in top federal and state highway officials, including Secretary of Commerce Sinclair Weeks and interim Highway Administrator John A. Volpe to give an accounting on progress made so far toward getting the mammoth roadbuilding program under way.

The committee showed it is "disturbed" over reports of lack of progress on the "Grand Plan" for highways. It obviously was trying to uncover grounds of dissatisfaction with the highway program to use as a springboard for further hearings.

Takes a Closer Look at Highway Program

JOHN A. VOLPE, (left) interim Highway Administrator, listens seriously while his boss, Commerce Secretary Weeks, explains administrative points.

C. D. CURTISS, Commissioner of Public Roads, uses charts to indicate progress.

At the outset, the committee was not too successful in finding fault; in fact Highway Administrator Volpe managed to get committee members to praise his handling of the program to date.

Discussions on the road bill are not going to follow straight party lines. Republicans and Democrats alike are more concerned over problems cropping up on the road program back home than they are in setting out to embarrass the Administration.

I. Progress

Secretary Weeks told the committee that in the first six months of operation, some 743 miles of interstate system roads costing over $900 million have been actually authorized for advertisement of bids. Included were 496 miles of road construction already building at a cost of about $286 million.

The total amount of federal money that has been obligated up to January 1 on the network of highways, including primary and secondary roads, amounted to over $1.7 billion.

Progress on the road system is moving so well, Secretary Weeks says, that "If we continue only at the same rate for the balance of the current fiscal year, an amount equivalent to all of the fiscal year 1957 authorization of interstate funds will be committed to approved plans and right-of-way acquisitions by June 30, 1957.

"This will be the first time in history that funds in an amount equivalent to the total authorized for any particular fiscal year have actually been obligated for plan approvals during the fiscal year then current." In fact, Weeks pointed out, "six states not only have committed all of their 1957 interstate funds, but have begun working into those apportioned for the 1958 fiscal year." (See table on the next page.)

Backing up the Administration in a report of general progress for the program were W. A. Bugge, president of the American Association of State Highway Officials; Fred W. Heldenfels, Jr., vice president elect of the Associated General Contractors of America, Inc.; J. N. Robertson, president of the American Road Builders Association; Major General Louis W. Prentiss, U. S. A. (Ret.), executive vice president of ARBA, and other industry spokesmen.

The legislators, however, are not as enthusiastic over progress of the program. Senator Gore said he is "disturbed over the lack of uniformity" among the various states in getting the road construction started. And, he pointed to reports that some five states have not yet committed any of their 1957 apportioned money. The idea of the highway program, Gore told the roadbuilders, was to end up with a completed net of highways at the end of the 13-year program—not just part of them.

Senator Francis Case questioned an example of progress on primary, secondary and urban systems as presented by Highway Administrator John Volpe. For the calendar year 1956, Volpe told the committee, "Contracts were advertised on these programs totaling $752 million, as compared to $716 million for the calendar year 1955." Actually, Volpe said, "Contracts using primary, secondary and urban funds were advertised during the calendar year 1956 in an amount equal to 93% of the total 1957 apportionments."

But, Senator Case wanted to know just how much the additional spending means in terms of miles of road built. He seemed to think that the increased cost of construction knocked out much of the Administration's show of progress.

BERTRAM D. TALLAMY, whose appointment as Highway Administrator is imminent, looks quizzical.

II. Slow States

Volpe told the committee that he, too, was "not entirely happy" about the slowness of some states to get their programs under way. But, in most cases there were valid reasons for the tardiness.

Many state laws are not adequate for such a big program, Volpe said, and 45 of the state legislatures are meeting this year to make adjustments. Adequate state appropriations to match federal aid money is the common ailment, but laws on acquiring rights-of-way and authority to control access need updating, too.

Bugge told the committee that a poll of the states showed that eight states—Idaho, Indiana, Maine, Montana, Nebraska, New Hampshire, South Dakota, and Vermont—report they need additional state funds to match federal aid

apportionments for fiscal years 1957, '58 and '59.

Twenty-four other states, however, report they will have to ask their legislatures this year to increase state highway revenues in order to keep programs for non-federal aid highway construction going.

A factor, too, in the slow start for some states is that many were operating on relatively low budgets and could not divert money for advance planning only on the hope that Congress would pass the highway bill.

In order to spur activity in those states that are below the average mark for progress in the first six months period, Volpe told the Congressional committee that he was making personal visits to Nebraska and West Virginia at the request of the state officials to push the program along. Other states that have been slow in getting started were contacted last week, Volpe said and urged to speed up activity.

In line with the move to step up state action on the big highway program, the Highway Administrator informed the Senate committee that the bureau had further "decentralized" administration of the program effective January 1 so that virtually all of the operating decisions are now made in the field by Bureau of Public Roads local representatives.

III. Right-of-Way Acquisition

To date, about $350 million of federal aid money has been obligated by states for the acquisition of some 1,700 miles of interstate rights-of-way, the committee was told. In all, the right-of-way cost for the interstate system is estimated to run about $5 billion.

So far, only one state—Illinois—has had to ask for federal assistance in acquiring sections of right-of-way. Even then, a state settlement was reached before the federal government was forced to act. Almost one-third of the states, including Illinois, must revise state laws in order to acquire right-of-way without delays, however.

Of the 40,000 miles originally authorized for the interstate system, the general location of 37,400 miles has been approved. Of some 22,000 miles of the road that has been finally located, about 25% follows the existing highway, and 75% is moved to a new location.

In industrialized areas, states are finding it cheaper to put the new highways on new locations and retain the old one as a frontage road, where rights of access on both frontages must be obtained in order to control access, Volpe reports.

In order to pump more money into the actual construction side of the road program, by assisting states to match federal-aid money, General Prentiss urged that a federal highway right-of-way revolving fund be set up. The fund, Prentiss said, would permit the federal government to pay 100% of the cost of advance right-of-way acquisition when requested to do so by individual states. Then, as states actually move in to build on the right-of-way, they would reimburse the revolving fund.

As it stands, states acquiring rights-of-way as early as five years in advance of need are tying up money that otherwise might be used for construction.

How the Money Goes Out

Based on testimony before Congressional committees in Washington last week, here is a table showing what percentage of federal funds for the interstate highway system have been obligated by the states, as of January 1. The term "obligation" includes money for preliminary engineering, acquisition of right-of-way, contracts awarded and contracts advertised but not awarded:

These six states have obligated 100% of 1957 money, plus percentages shown of 1958 money:

- Maryland—58%
- California—26%
- Ohio—24%
- Illinois—18%
- Rhode Island—10%
- New York—2%

Six states with 75 to 100% of 1957 money obligated:

- Missouri—99%
- New Mexico—90%
- Wyoming—88%
- Tennessee—85%
- Oregon—81%
- Massachusetts—79%

Nine states with 50 to 75% of 1957 money obligated:

- Texas—68%
- Colorado—65%
- Pennsylvania—65%
- Alabama—61%
- Minnesota—58%
- Kansas—52%
- Michigan—52%
- Vermont—52%
- Iowa—50%

Eleven states with 25 to 50% of 1957 money obligated:

- Arkansas—49%
- Connecticut—45%
- Florida—39%
- Mississippi—38%
- Oklahoma—38%
- Kentucky—35%
- Wisconsin—33%
- Georgia—28%
- Utah—27%
- Washington—27%
- Louisiana—25%
- Washington, D. C.—25%

Sixteen states with 0 to 25% of 1957 money obligated:

- Idaho—22%
- Arizona—21%
- New Hampshire—21%
- South Carolina—17%
- Indiana—11%
- Maine—11%
- South Dakota—11%
- North Carolina—10%
- North Dakota—10%
- Virginia—9%
- Nevada—8%
- Delaware—0%
- Montana—0%
- Nebraska—0%
- New Jersey—0%
- West Virginia—0%

IV. Wage Rates

The process of predetermining wage rates on the interstate system by the Department of Labor has not slowed construction, officials say. But Congress plans to call in contractors later on to hear their side of the story.

About 90% of the wage determinations made by the Labor Department to date have been put at the same level as rates in effect in the states submitting the request. Only minor adjustments have been made in the other cases.

As an example of the speed with which the Secretary of Labor is handling the wage predetermination requests Volpe cited Massachusetts. Volpe said he wired the Labor Department with the request for a wage predetermination, and within 48 hours had it— in this case, at the same level as being paid by the state.

The legislators wanted to know if the wage level set for the interstate projects was carrying over to other road construction within states. But, there was no information available. Contractors will likely provide more details when they report to the committee.

The roadbuilders' association asked for an administrative change in the current requirement for this section of the act. Right now, contractors are required to submit weekly payrolls to the Department of Labor, presumably for audit against approved wage rates. In view of the thousands of such weekly reports that will be going to Washington once the program begins to roll, ARBA questions the value of the requirement. They feel that it works a hardship on both the field contractor and the government staff.

V. Adding Mileage

So far, states have submitted requests for a total of 12,500 miles of additional interstate roads—whereas only 1,000 miles authorized by Congress last session is as yet unapportioned.

It seems sure that Congress will attempt to expand the interstate mileage this session. But the Administration and state highway officials advised against such a move at this time. They feel that adding additional miles to the network might well jeopardize the whole program by making financing of the measure seem impossible.

Bugge, in fact, urged that no exten-

sions of the present 41,000 miles of interstate roads be made until the current program is "at least 75% completed." This might take about nine years, Bugge said.

The legislators, however, are not keen to see extra mileage requested by their states placed on the shelf for this long. The committee asked the Bureau of Public Roads to submit a proposal of extensions to the interstate system on roads requested by states that are of comparable importance to the nation as the present interstate system.

This report is sure to touch off a scramble among states to revise previous requests for mileage. Some had based their requests on a spread of the 1,000 miles among the states, and they are sure to increase this if the door seems to be open for more 90-10 highways. The State of Washington, for example, only asked for 50 additional miles of interstate roads—as compared to 150 miles requested by Texas.

A Congressional attempt to increase the present highway mileage is no shoo-in, however. Senator Roman L. Hruska (R—Neb.), sitting in with the subcommittee, argued that no major extensions to the program should be made at this time. He reasoned that states would likely build any road mileage they actually wanted as primary roads if there was little chance for them to get extra interstate mileage.

VI. Materials, Machinery

By and large, AASHO says all states are able to handle their share of the road program. With the exception of steel and cement, little trouble is expected on getting building materials or machinery. Cement may show spot shortages, but even this material is not expected to cause serious delays on projects.

Steel supplies may prove to be a real bottleneck. Wider use of prestressed concrete is expected to help ease the pinch. But deliveries on structural steel shapes and plate are running as much as 20 months behind schedule. Within the last year and a half, prices have increased by about 10%. Estimates are that some 510,000 tons of steel are needed for each $1 billion of highway construction. Volpe estimated that about 5% of each highway dollar goes for steel purchases.

"The $64,000 question on what to do about steel," is the big problem facing the highway program at present, Volpe told the congressmen. Since contractors now get steel quotations with escalation clauses of as much as $6 a ton, they bid on projects accordingly.

As one contractor told the committee, it amounts to a "gamble." If he guesses right on steel prices, he is safe, but a wrong guess can cost him his shirt. Time limitations on construction projects often force contractors to buy warehouse steel rather than wait longer for the cheaper mill deliveries.

Just how much all this is increasing the cost of the program is something they plan to look into in the near future.

Both the Administration and contractors knocked down Congressional queries about windfall profits or price agreements between contractors on bids. In fact, they said competition on bids has resulted in an average low bid price 3.9% below engineering estimates for the first three quarters of 1956.

For this period, there were some 12,610 bids received on 2,255 federal-aid projects, or an average of 5.6 bids per project.

One step being undertaken to help states in planning both material and engineering manpower needs, Volpe said, is a catalogue of available bridge designs that the bureau is preparing for circulation among the states. Thinking is that the states can save both time and money by adopting an existing design for a good share of the estimated 3,000,000 structures that are slated to go into the highway network.

VII. Recommendations

A group of procedural changes were recommended to the Congressional committee by General Prentiss, for the ARBA. If adopted, Prentiss told the committee, they would increase contractor efficiency and result in a net saving to the taxpayer. Their adoption depends on final action by the committee after final hearings are held.

- Prentiss recommended: Reduce the time required to pay contractor partial payment vouchers. Detailed checks could be made after payment, Prentiss said, with any necessary adjustments made in subsequent vouchers.
- Limit retained percentages of 10% to payments for the first 50% of projects. If half of the work has been done successfully, no additional retentions are needed to protect the state.
- Encourage the use of aerial photography and photogrammetry to compute final pay quantities. This could save 60 to 90 days in paying a contractor's final voucher.
- Where delays in final payment exceed 60 days after acceptance of work, the contractor should be paid interest thereafter for money due him.
- Where new construction machinery has been developed, if satisfactory performance on a federal-aid project is demonstrated in any one state, the Bureau of Public Roads should be able to authenticate this performance to all states. As it stands, manufacturers must get each state to approve new construction methods.

Suez Salvage

Progress is faster than pessimistic prophecies

Cable from Cairo—The early estimates that the Suez Canal would be closed for from six months to a year, before a channel could be cleared through the sunken obstructions, are being shown up as unfounded. General Raymond A. Wheeler (U. S. A. Ret.), former Chief of Engineers, in charge of the clearance operations for the United Nations, has said a channel for 25-ft draft ships will be open by March 10, and that normal service for all ships will be restored by May 20. Privately, some of General Wheeler's experts predict that the March 10 date will be beaten.

Even the two so-called "worst" obstructions have not lived up to their advance billings. The collapsed east span of El Ferdan Bridge was easily lifted by the German salvage vessels Energie and Ausdauer, cut free from the east span and deposited on the canal bank. Then as these two vessels moved on to the other much discussed obstruction, a sunken cement-laden LST, General Wheeler had the Dutch cranes Arend and Condor remove the damaged west span before it could collapse.

It is probable that the LST, lying on its side with its bow above water and its stern submerged, can readily be righted and pumped out. Its cement cargo was greatly exaggerated, and will occasion no difficulty.

None of the wrecks, it is now believed, will have to be dynamited—this will make for salvage speed and reduce the danger of damaging the canal bottom and banks.

Clearance operations at the north and south canal entrances, Port Said and Suez, are also well in hand. It is notable that with a channel already open through Port Said harbor, one French and eight British military salvage vessels are still working alongside the salvage vessels of private firms to clear up marginal obstructions. These latter are largely the dredges and other maintenance vessels of the Suez Canal Company which will be needed by the Egyptian Canal Authority to keep the opened canal in operation.

In this connection, however, General Wheeler has said that not much initial dredging will be necessary because silt accumulation, largely caused by the churning action of passing ships, has not been appreciable since the canal was closed.

With the salvage operation in hand, General Wheeler is turning his attention to the problem of repairing the communications and lighting systems along the canal, and restoring the workshops at Port Fouad.

Highway Research Board hears . . .

Test Road to Be Ready in Fall

The American Association of State Highway Officials, test road now under construction near Ottawa, Ill., is expected to be ready for operation next fall. This was reported last week at the 36th annual meeting of the Highway Research Board in Washington, D. C.

W. E. Chastain, Sr., physical research engineer for the Illinois Division of Highways, who made the report, also disclosed that almost $2.7 million worth of contracts have been placed for the test road's construction. The sum is at least $400,000 over the original cost estimate. Chastain said most of the additional cost stems from introduction of a fifth loop for 2,000- and 6,000-lb axle loads for tests required under the federal-aid Highway Act of 1956.

Construction work under contract so far is broken down into four contracts: (1) fabrication of steel for four grade-separation structures and for two steel I-beam test bridges; (2) two major drainage structures; (3) substructures for the test bridges; (4) grading.

The grading work was last year's major construction operation on the AASHO project. Nearly 1¼-million cu yd of earth was moved. About half of this has been placed in the upper three feet of the test embankment, where controls "are probably stricter than ever before attempted on a large scale for highway embankments."

W. N. Carey, Jr., the AASHO test road's chief engineer, reported that the major test will involve the "relative behavior of different thicknesses of conventional types of pavement." In addition, there will be side studies dealing with the effect of paved shoulders, the relative value of several types of base, and the effect of certain specified traffic on test bridges.

Said Carey: "Available space and funds did not permit experimental designs for these side studies as comprehensive as those in the main test, but they are so designed that limited—but sound—conclusions can be drawn from them."

He commented that the project includes 836 test sections. Ten traffic lanes will be tested under specific axle loads ranging from 2,000 lb on single axles, to 48,000 lb on tandem axles. Half of the pavement under each loading will be rigid type and half will be flexible.

W. B. McKendrick, AASHO road test project director, reported that of the 50 engineers permanently assigned to the project last October, 35 were from the Highway Research Board's staff, nine from the Illinois Division of Highways, three from the U. S. Bureau of Public Roads, and three were observers. An additional 90 engineers have been on temporary duty with the project from the same organizations and from other states.

About 275 highway engineers, administrators, and safety experts, representing government and industry, attended the five-day Highway Research Board meeting. In addition to the progress report on the AASHO road test, which lead off the program, the agenda included sessions on economics, finance and administration; maintenance and construction; night visibility; design; traffic and operations; soils; and materials and construction.

The Highway Research Board's Roy W. Crum Award was given to Francis N. Hveem, chief of the materials and research department of the California Division of Highways "in recognition of outstanding achievement in the field of highway research." Chester A. McDowell, senior soils engineer of the Texas Highway Department, received the Highway Research Board Award for the best paper presented at last year's annual meeting, "Inter-relationship of Load, Volume Change and Layer Thickness of Soils to the Behavior of Engineering Structures."

Big Dam Set to Go

"Immediate" start urged on Feather River scheme

An immediate start on Oroville Dam of the $1.5-billion Feather River Project was urged by California's Gov. Goodwin J. Knight in his report to the 1957 session of the legislature last week.

The governor recommended adoption of the $14-billion California Water Plan (ENR May 17, 1956, p. 27).

He proposed the early establishment of a water development fund. Money for this fund, he said, is available from oil royalties.

He called for a solution of controversial water rights problems that are a threat to water project construction.

Governor Knight also suggested that the state assist local governmental agencies in the development of their own water resources by providing loans on a long term, low interest rate basis.

• **Oroville Dam comes first**—"First in urgency for action, in my considered judgment," Knight told the lawmakers, "is the appropriation of funds to initiate actual construction work in preparation for building the Oroville Dam, reservoir and power plants."

This is the 730-ft dam (a new U. S. record) on the Feather River to make water available for exporting into the San Joaquin Valley.

"I recommend for your immediate consideration a total appropriation of $63.2 million for the furtherance of this work between now and June 30, 1958," Knight declared. "Of this amount, I recommend that you make immediately available an urgency appropriation of $25.2 million."

• **Bids by March**—Favorable action on the immediate appropriation, Knight noted, will make it possible to call for bids by March on the first phase of relocating the Feather River Highway and Western Pacific Railroad in the Oroville reservoir area.

"By acting on the urgency appropriation in January," he said, "the state will gain from six to nine months in the construction schedule of this greatly needed project.

"We cannot afford to risk delays of even as much as six months. To do so is to increase the risk of future loss of human life and property, such as was experienced during the 1955 floods.

"The state recently was granted a license for the Oroville features by the Federal Power Commission. This license is subject to the condition that building of the structures must be completed and operative within seven years. With that deadline, we simply cannot afford procrastination and delay."

• **Federal funds to be sought**—Governor Knight said, "We expect to ask the Congress now in session to approve flood control appropriations for Oroville Dam in the amount of $100 million."

In urging the legislators to accept the California Water Plan, Governor Knight pointed out that it is not a proposal for construction.

"Each unit or item of construction will come before the legislature for consideration at an appropriate time."

Governor Knight told the legislators the state will cooperate with the federal government in building water projects. He also expressed confidence that "we can reach agreement" with the Department of Interior on the terms of a contract for federal financing and construction and state operation and repayment of the San Luis reservoir in San Joaquin County as a unit of the state's Feather River Project.

• **Water rights question**—The governor informed the legislature that one of its most pressing problems is to settle the counties-of-origin water rights question.

Water for exporting to Southern California must come from the northern part of the state and present law gives counties in which the water originates a firm right to that water.

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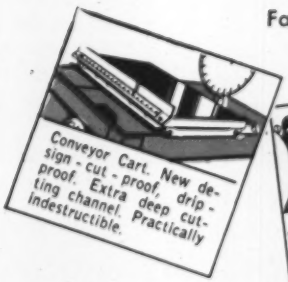

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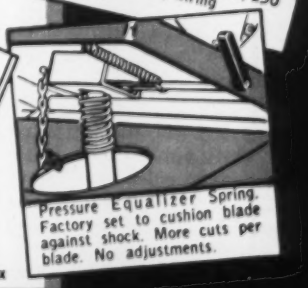

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The very high strength of USS "T-1" Steel has helped Athey Products Corporation, Chicago, Illinois, to solve the problem of providing a high-volume trailer for hauling lightweight materials such as bauxite ore. This new rear-dump trailer is bigger than conventional units, yet...

WEIGHS 3½ TONS LESS

The very high yield strength of USS "T-1" Steel—90,000 psi minimum—enabled Athey to increase working stresses and reduce the thickness and weight of drawbar and draft frame structure and of all load-containing body plates. As a result, this unit weighs just 26,000 pounds—7,000 pounds less than conventional units—and, consequently, it . . .

TRAVELS FASTER

It can make empty trips much faster . . . can negotiate steep grades in one higher transmission speed than conventional units. Even with a full load of 35 tons, this lightweight unit can climb 14% grades in second gear. By reducing weight, USS "T-1" Steel speeds operations, cuts non-productive time, and makes possible a larger trailer that...

CARRIES MORE PAYLOAD

This trailer has the lowest ratio of vehicle weight to load weight ever designed . . . and carries a full 30.5 cu. yds.—8 yards more than conventional units of the same weight-carrying capacity. It promises to increase, materially, the efficiency of hauling *lightweight* materials...

THANKS TO USS "T-1" CONSTRUCTIONAL ALLOY STEEL

USS "T-1" Steel's toughness and resistance to impact abuse assure Athey the ruggedness and durability needed in off-road mountain service. Its excellent weldability kept fabrication simple.

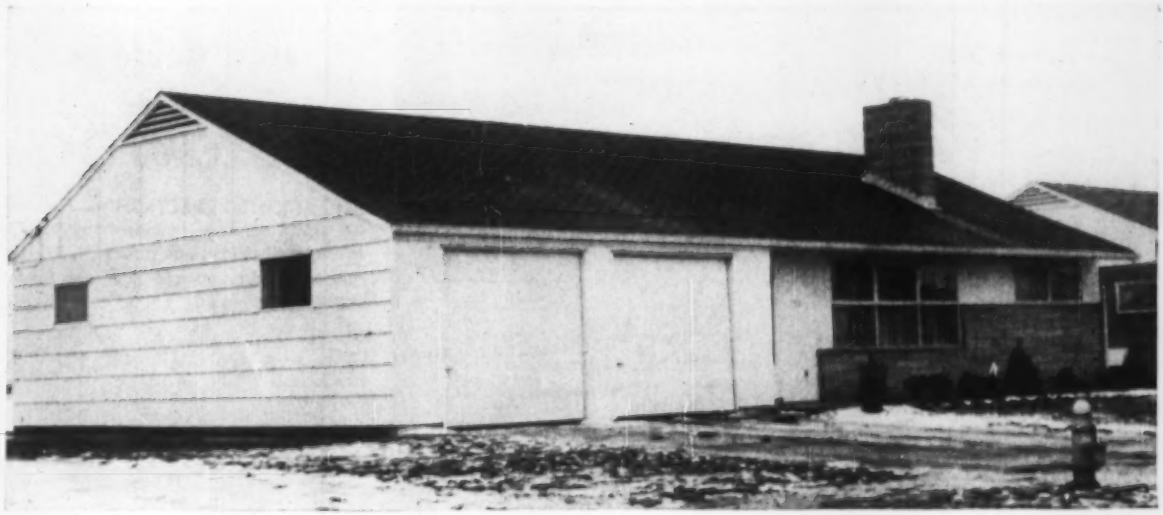
USS "T-1" Steel can help you in a wide variety of heavy-duty applications. Get complete facts—call our nearest sales office, or write to: United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

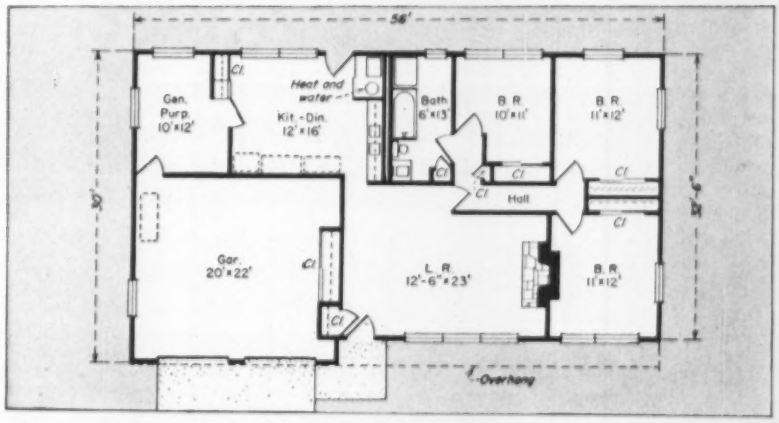
UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

See The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your newspaper for time and station.

USS

UNITED STATES STEEL





A three-bedroom house goes up every four days in a Berea, Ohio, project by the "team" system of construction.

More House for Less Money

A full-scale demonstration of how to build single family houses to sell for less than the FHA-appraised value—and under the average equivalent market price—has just been completed at Berea, Ohio, a suburb of Cleveland.

There are 250 houses in the subdivision, built by the Fred Schmitt Construction Co. Inc., Berea. The last 70 houses were completed during 1956. They sold in a price range of $15,000 to $20,000, at an average of $2,500 less than the FHA appraisal. This was also $3,000 to $4,000 under the average equivalent market price.

• **No subcontractors**—These substantial cost reductions were the result of the "team" system developed by Robert F. Schmitt, president of the company, who has employed it during the past four years. According to Schmitt, who was in direct charge of the project, the principal factor is the elimination of all subcontracting.

The subcontractor concept is the first stumbling block facing a progressive builder, contends Schmitt. For he is often at the mercy of poor scheduling, poor planning, poor buying, poor management and poor design of the subcontractors, if they happen to be inefficient.

Moreover, there is apt to be considerable waste in the distribution system of materials and equipment, predicated on the subcontractor system. As a result, the home buyer may have to pay four to five profits on much of the material and equipment going into his home.

• **Increased responsibilities**—When Schmitt had eliminated subcontracting from his home-building projects, he found that the scope of his responsibilities had increased substantially. For he was, in reality, the direct employer, designer, purchaser, methods devisor, production planner and engineer for every phase of his home building.

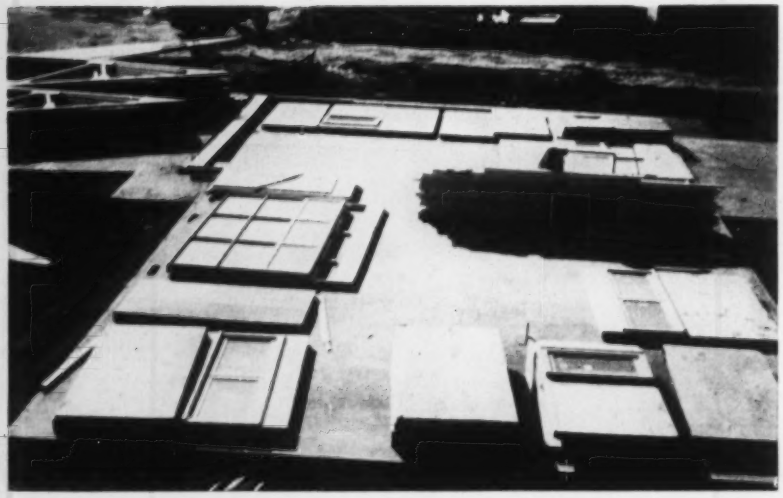
But this concentration of responsibility and authority had its redeeming virtues. It was an important step toward desegregation of conventional production phases, integrating them into a coordinated operation.

The next important step was simplification of the construction operations. With all phases of the work under one control, this was a natural instinct of both the builder and his employees.

• **No bottlenecks are allowed**—One of Schmitt's over-riding objectives throughout his homebuilding is continuity of operations. A low-cost method, material or technique—no matter how cheap—resulting in a production bottleneck, is a questionable saving.

Stops and starts are expensive. Moreover, interruption of construction phases of a housing project is bad psychology for the workers. It demoralizes their natural instincts to compete with themselves.

(Continued on next page)



STREAMLINED ERECTION was facilitated by neatly stacking building-frame components (left) and roof trusses (below) on previously cast concrete floor slab, before starting erection.

• **Secondary economies**—Schmitt derived a number of secondary economies from his homebuilding methods. Simplification of the work made his labor force more fluid by permitting one man to perform more than one type of work.

This procedure generated continuity, which, in turn, helped hold together a more stable and efficient crew. It no longer became necessary to lay off a man when his work was finished. He could be switched to another phase.

With his simplified work approach, Schmitt found that he could build smaller groups of houses with a given labor force or at a given volume rate.

It wasn't necessary to have large operating capital. Nor was it necessary to stretch out a job in order to use effectively the various specialized trades. This idea was beneficial, in a secondary manner, since men working with a recognizable objective do so more efficiently.

• **Standardized components**—In building the 250 houses at Berea, Schmitt used what he terms the, "Standardized Component Technique." Wall framing was accomplished by a panel system, designed for mass prefabrication. The drainage, water and gas line systems were also prefabricated, for easy installation. Workmen installed these prefabricated components with no delay to the over-all construction phase during which their installation became necessary. The floors of the houses are concrete slabs, while the roofs are timber-frame construction.

• **Organized production**—Organization of the production force on the project was considered equally important to cost-cutting techniques.

Considerable care was given to providing efficient and economical working conditions both off-site and on-site. And the logistics of materials supply, as well as materials handling on the job, were recognized as important factors in the production schedules.

• **Phase construction**—Another feature of Schmitt's operations that made them unique among homebuilders is "phase construction."

Building a house was not thought of in terms of plumbing, wiring, heating, painting, flooring, etc.; but rather in terms of three phases: foundations, framing and finish.

▶ **Phase I (foundation)**—One work force under the direction of a supervisor performed all seven operations under Phase I of the project. They included construction of the footer beams, foundation walls, and floor slab; installation of the heating-duct system, roughed-in plumbing, all on-site concrete work; and grading of the site area for drainage and good mobility for the next construction phase.

▶ **Phase II (framing)**—The nine operations in this phase were performed by a crew under one supervisor who had complete responsibility for their scheduling. They included framing; rough wiring, done in two stages; second stages of plumbing and heating; wallboard and finish floor application; exterior finish and painting; and cleaning up preparatory for the next construction phase.

▶ **Phase III (finish)**—One supervisor and crew handled all seven operations of this final phase of the work. They included wallboard taping; interior finish and painting; third and final stages of plumbing, heating and electrical work; and final clean-up.

An average of 850 man-hours of on-site labor was required to complete one house. Of that amount, Phase I took 250 man-hours; Phase II, 310 man-hours; and Phase III, 290 man-hours.

In general, ordering material for any one phase, or releasing it, was done by each phase supervisor.

• **Flexible interchange**—The work pattern was kept on a flexible basis. There was frequent interchange of men among the three construction phases.

(*Continued on page 36*)

AT GARRISON DAM:

Owner-Engineers: Garrison District, Corps of Engineers, U. S. Army
Prime Contractor
Penstock & Surge Tanks: Southwest Welding and Manufacturing Co.

powerful penstock pressures confined with Prepakt concrete

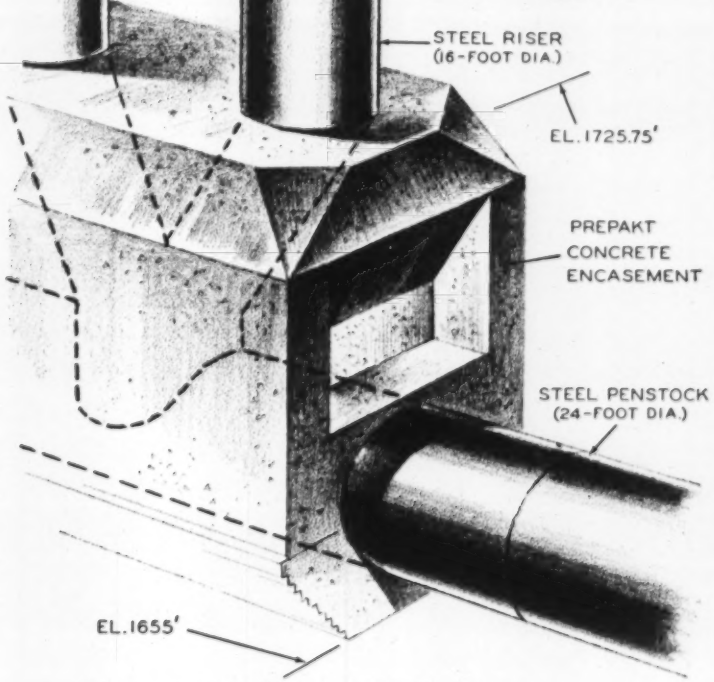


Diagram of Garrison Dam riser connection shows how 2,700 cu. yds. of PREPAKT concrete were used to encase it and tie two branches together.

Gigantic dimensions of riser and indeterminate stresses required heavy reinforcement and strong, low-shrinkage concrete.

Despite this dense reinforcement with heavy bars, PREPAKT methods and materials made possible the placement of high-quality concrete.

High-strength PREPAKT concrete now provides complete, monolithic encasements for three penstock riser connections at the 400,000 kw. Garrison Dam power plant on the upper Missouri River.

This concrete embedment is a strong supporting structure for the steel liner and helps take the high, fluctuating hydrostatic loads in the critical stress areas between penstocks and surge tanks.

PREPAKT concrete, made "in the form" by consolidating preplaced coarse aggregate with INTRUSION mortar, was used to (1) assure thorough embedment even under invert and at crown, (2) produce a permanent, tight bond between steel liner and concrete and (3) permit simplified but thorough placement in a very heavily reinforced area where conventional methods would have been difficult.

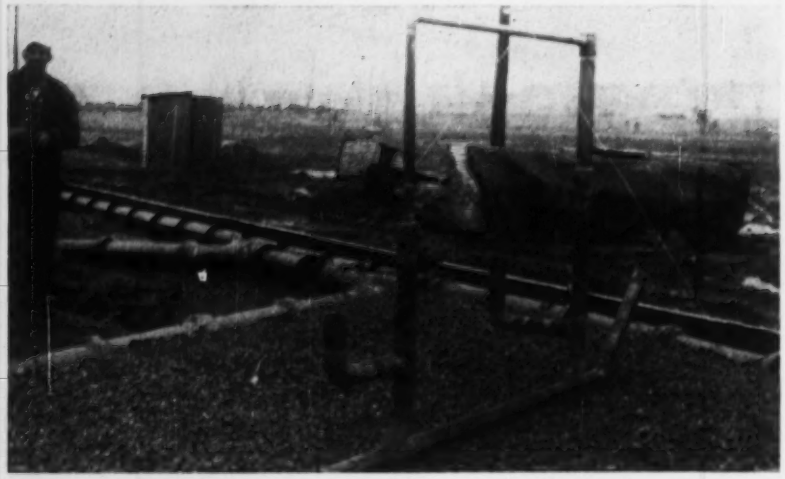
This is another successful project completed by INTRUSION-PREPAKT—specialists in concrete construction and maintenance who maintain a complete field construction organization and provide an engineering service. INTRUSION-PREPAKT, Inc., Room 568-C, Union Commerce Building, Cleveland 14, Ohio. In Canada: INTRUSION-PREPAKT, Ltd., 159 Bay St., Toronto, Ontario.

INTRUSION-PREPAKT, INC.

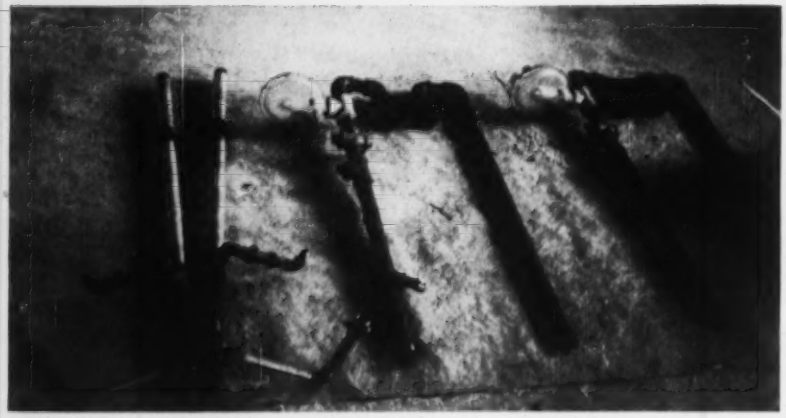
OFFICES IN PRINCIPAL U. S. AND FOREIGN CITIES

Intrusion and Prepakt are trade marks of Intrusion-Prepakt, Inc., whose methods and materials are covered by U. S. Patents Nos. 2313110, 2655004, 2434302 and others, also patents pending.

. . . "Team" operation builds more for less money



DRAINAGE ASSEMBLIES were standardized to simplify installation.



GAS LINE ASSEMBLIES were prefabricated to save time in the field.

The important factor was that the men were not working "vertically" throughout the production of a home. Or, stated differently, they did not carry a trade through its phases independent of the over-all organization. Instead, they worked wholly as a segment of that phase.

The various stages of one trade were often performed by different men. For example, the three stages of plumbing were each performed by different individuals.

• **15 houses in 60 days**—No great production or construction records were attempted in building the 250 homes at Berea. However, it usually required only 60 days to complete a group of 15 homes.

Due to its organizational size, the Fred Schmitt Construction Co. found that building the houses in small groups of about 15 effected the greatest economies.

The houses average 1,800 sq ft in area. They feature a woodburning fireplace, and liberal usage of masonry exteriors. From three to six standard floor plans were used for each group of houses, with a wide variety of exterior finishes. In addition the customer had several options of plan variations and custom-built features.

• **Group bonus**—Worker productivity was high, generally. It was found that with an operation in small groups, a greater internal energy was generated toward the completion of that particular group of 15 houses.

Occasionally, a group bonus was paid when target completion dates were met for any one phase, or for the group as whole. Thus, when the organization was working toward a recognizable goal, the normal individual reaction was such that faster progress was made.

• **Man-hour standards**—Building the houses in small groups of about 15, and employing the phase-system of construction, made it possible to establish man-hour standards per operation per house, and per group of houses. These standards soon became familiar to all the men, due to the repetition of construction operations.

Each operational phase for a group of houses under construction in the 250-house project was usually completed before starting the next one. Care was taken to see that there was an absolute minimum of back-tracking from a phase in process to a former phase to perform odds and ends.

• **Curbs, walks and drives**—For example, the crew in charge of Phase I construction installed all curbs, public walks and drives needed to serve the group of houses being built prior to moving on.

This attention to detail in organizing the work was carried even farther. It was broken down within a given group, so that all such items in Phase I were completed whenever possible, before starting Phase II. This procedure not only resulted in efficiency and orderly construction in Phase I, but also increased the efficiency of Phase II from the standpoint of good working conditions.

• **A typical house group**—The end result of Schmitt's integrated, efficient and cost-cutting homebuilding program was a strong demand for the houses. In fact, the individual houses were always sold at least six months in advance of groundbreaking. Chief reason for this demand was that the buyer got more house for his money.

Take, for example, one typical group of eleven homes. The area of the most-frequently built model was 1,735 sq ft under roof. Of this area, 400 sq ft was garage and the remaining 1,335 sq ft was living area.

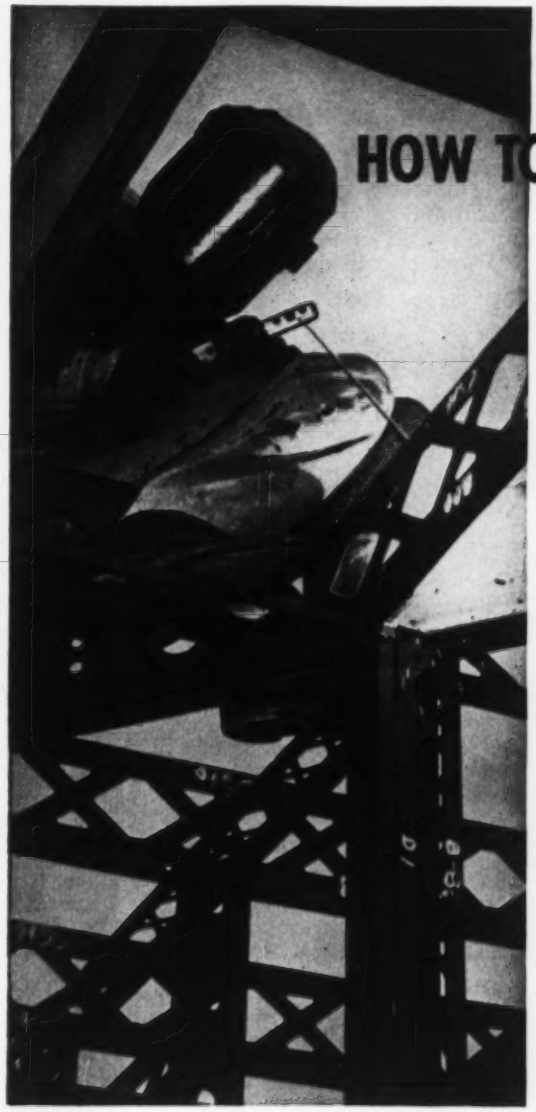
• **Sale price, $17,400**—The sale price of this most popular house was $17,400, including a fully improved 115x76-ft lot. By comparison, the FHA approved value was $19,800 and the FHA estimated replacement cost $20,400. Cost per square foot, excluding lot but including overhead, was $8.00.

All 11 houses were three-bedroom, with woodburning fireplaces and two-car garages. About half of them had built-in ranges and dishwashers.

Standard items of equipment in the houses included garbage-disposal unit; washer and dryer; double glazing in all windows; combination storm-screen doors; a 12-circuit, 100-amp electrical service, plus a range and dryer service; a perimeter heating system and complete insulation.

The attached garage for each house was completely finished. Landscaping included shrubbery and a fine grade of lawn. Driveways were concrete, 12 ft wide for single-car garages and 20 ft wide for two-car garages.

The entire 250-home subdivision has full street improvements.



HOW TO DESIGN FOR LOW COST... in light construction

LIGHTSTEEL structural sections are carefully designed for maximum economy strength-to-weight ratio. Waste and high cost of overdesigned framing are eliminated, yet LIGHTSTEEL carries all the benefits of conventional steel framing.

LIGHTSTEEL cuts construction costs because joists, studs, track and bridging are designed to fit together for ease of assembly and welding in the shop or on the job. Because of the light weight of the sections, complete wall units can be trucked to the job site where they can be erected in a few minutes. Additional savings are effected by precisely engineered openings in the sections which simplify through-frame installation of wiring and plumbing.

The LIGHTSTEEL nailing groove is an alternate feature which permits nailing of collateral materials to double studs and joists.

Want to know more about economical LIGHTSTEEL? Fill out the coupon below and mail it today.

PENN METAL COMPANY, INC.

General Sales Office: 40 Central Street, Boston 9, Mass.
Plant: Parkersburg, W. Va.
District Sales Offices: Boston, New York, Philadelphia, Atlanta, Charlotte, Chicago, Detroit, St. Louis, Minneapolis, Denver, Dallas, Seattle, San Francisco, Los Angeles, Parkersburg

What is LIGHTSTEEL?

Penmetal LIGHTSTEEL structural sections are fabricated from structural-grade, strip steel by cold forming and are designed specifically for strength, light weight and low cost. Now, for the first time, the light building field can adopt steel framework economically.

The components include a complete range of studs, joists and accessories for the steel framing of houses, schools, hospitals, light commercial and industrial structures and exterior curtain wall framing in multiple story buildings — all hitherto limited to less desirable materials.

Penmetal

P16-84

PENN METAL COMPANY, INC.
40 Central Street, Boston 9, Mass.

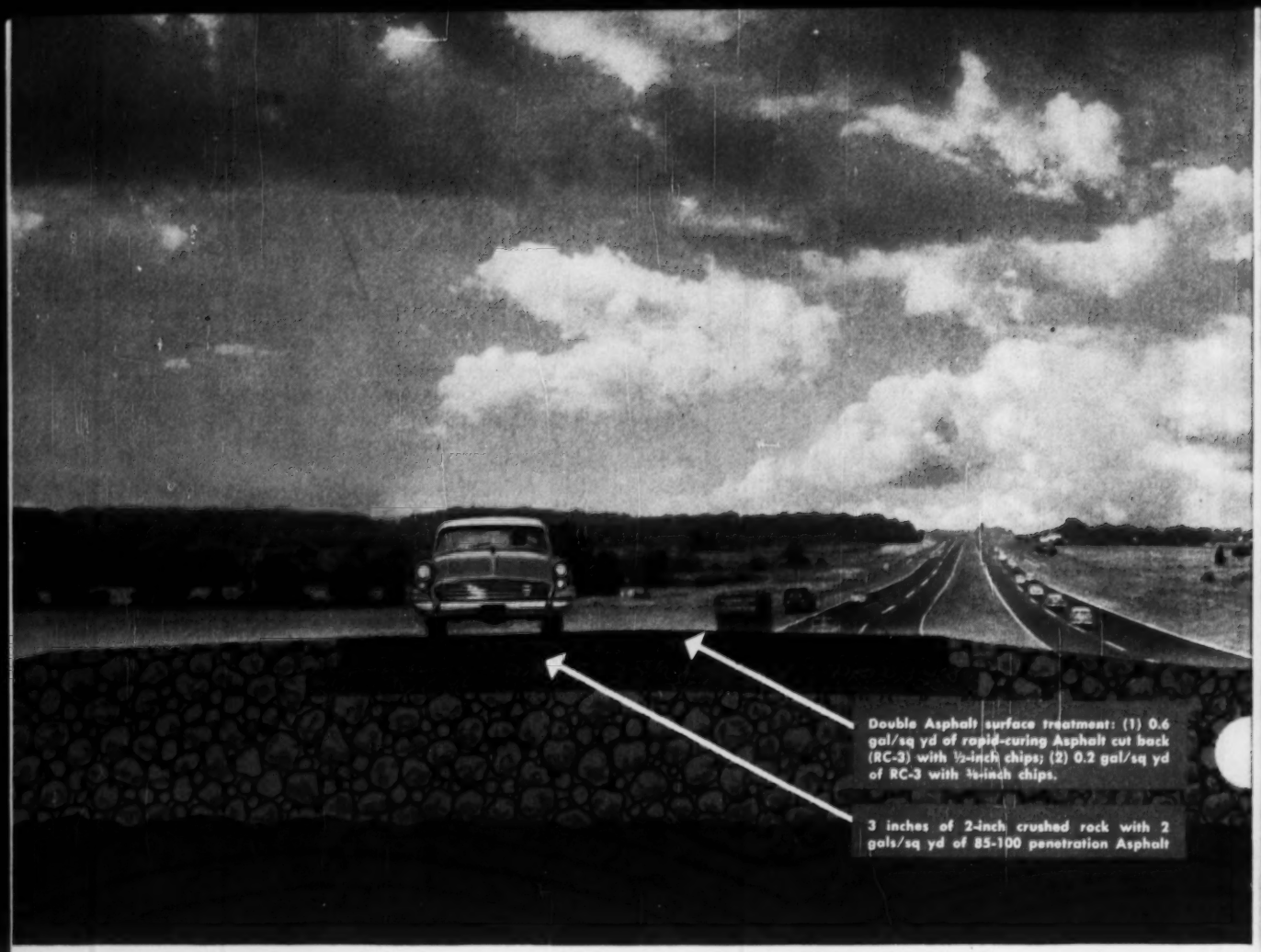
Please send me, without cost or obligation, a copy of
☐ LIGHTSTEEL catalog, SS-9, ☐ LIGHTSTEEL technical manual, SS-8.

Name .....

Company .....

Address .....

City ..... State .....


Double Asphalt surface treatment: (1) 0.6 gal/sq yd of rapid-curing Asphalt cut back (RC-3) with ½-inch chips; (2) 0.2 gal/sq yd of RC-3 with ⅜-inch chips.
3 inches of 2-inch crushed rock with 2 gals/sq yd of 85-100 penetration Asphalt

This ASPHALT superhighway costs New Hampshire

Since June 25, 1950, this New Hampshire Toll Road has been proof-in-operation of Asphalt pavement economy. Low in first cost. Low in maintenance cost.

ASPHALT construction saved $85,000 per mile in *first* costs, as well

Yes! This is the figure reported by New Hampshire authorities. $36.07. That's for maintaining pavement alone . . . all four lanes. The average cost per mile, per year during the first five years operation of New Hampshire's 14.7-mile Asphalt Turnpike . . . linking Asphalt Turnpikes of Maine and Massachusetts.

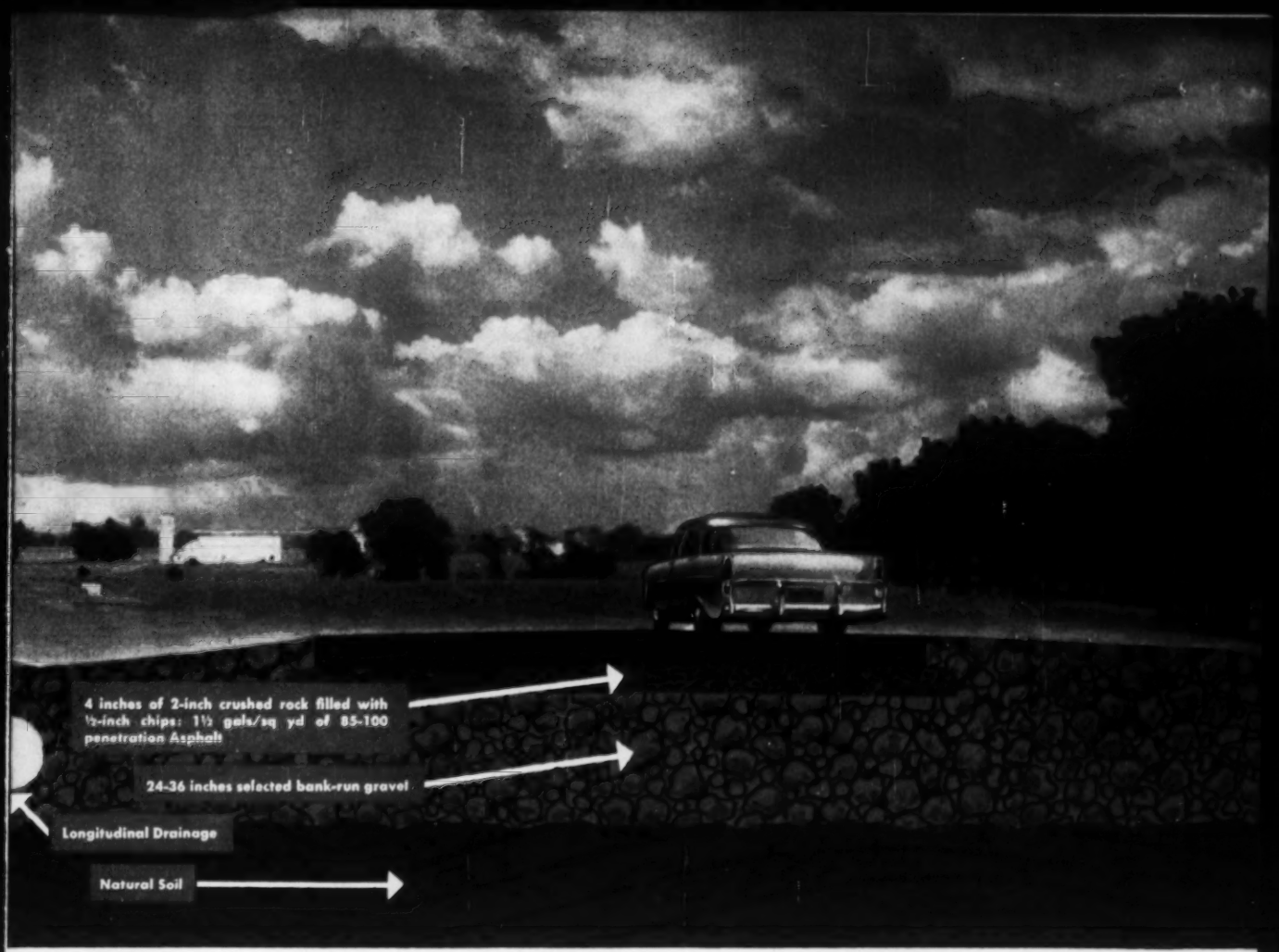
What's the five-year overall total? $2,651.06! Per year? $530.21! Per vehicle? (there were 14,520,723 of them) $.000175!

Can these be considered "yardstick" figures?

Yes! Other modern heavy-duty Asphalt pavements that carry heavy traffic and are in areas of severe weather variation have maintenance costs comparable to these. These maintenance figures seem remarkable . . . almost unbelievable . . . but such remarkable savings can be expected when heavy-duty rugged Asphalt pavements are properly engineered and constructed.

How was this low-maintenance pavement designed?

The section above shows basic construction . . . first a carefully selected sub-base, then two courses of Asphalt penetration


4 inches of 2-inch crushed rock filled with ½-inch chips: 1½ gals/sq yd of 85-100 penetration Asphalt
24-36 inches selected bank-run gravel
Longitudinal Drainage
Natural Soil

only $36.07 to maintain (per mile, per year)

macadam, topped with a double Asphalt surface treatment. Most sub-base material came from the right-of-way or adjacent borrow.

Bids for the Asphalt structure ran $85,000 per mile under next lowest bids for pavement of comparable specifications. Such a saving pays for many years of maintenance . . . not only of the pavement but of the entire right-of-way.

What about performance?

John O. Morton, New Hampshire Commissioner of Public Works and Highways, has this to say, "The pavement has shown performance during its first five years of use that leaves nothing to be desired."

For low costs, long life, high performance . . . for smooth, safe riding . . . design for Asphalt construction.

Safety is not a function of cost

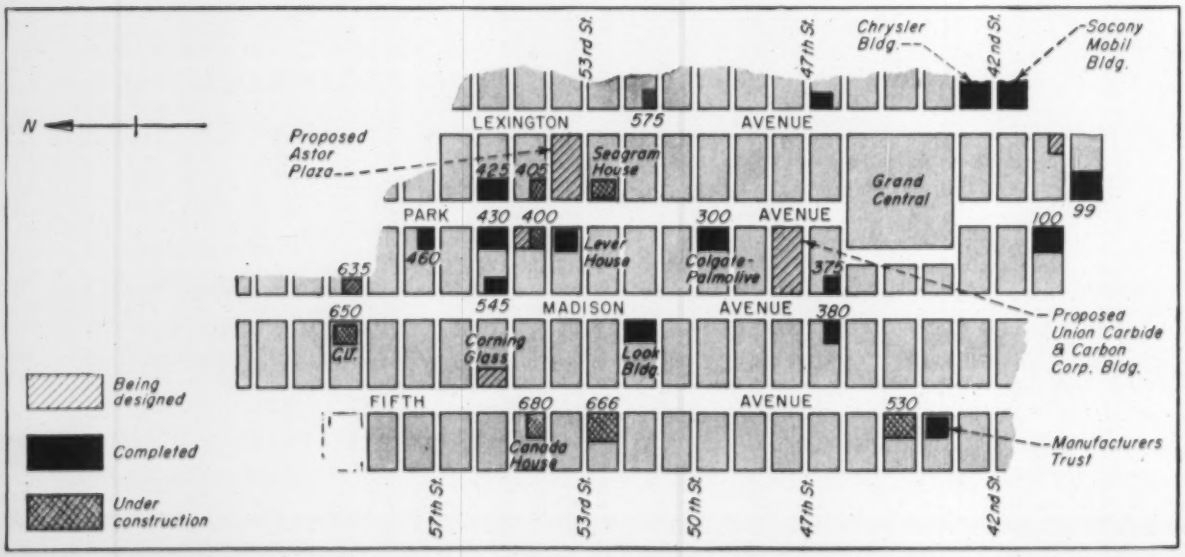
Despite its low construction and maintenance costs, New Hampshire's Asphalt Turnpike has achieved one of the best safety records on major highways in the nation.

THE ASPHALT INSTITUTE
Asphalt Institute Building, College Park, Maryland

Sign of the times . . .

In midtown New York, to meet the huge demand for office space, old skyscrapers are torn down to make way for new ones, which feature spectacular architecture to attract tenants

Office-Building Boom Alters



MIDTOWN MANHATTAN is breaking out all over in a rash of new skyscrapers. Park Ave., in particular, is being transformed "from the Gold Coast of luxury living to the Gold Coast of corporation headquarters."

New York Skyline

From the sidewalks of New York, you see today a changing city. In the midtown strip known as the Grand Central area, only four blocks wide and about one mile long, you will find at least 15 skyscrapers built since 1950 and eight more now under construction. And you probably will observe signs indicating that several more are about to be started.

You might note that the old hotel where you used to stay is no longer there. And the 18-story apartment house where some friends of yours once lived has disappeared. And the art galleries have moved. And there is a gaping hole with a power shovel in the center where once stood an office building where you used to do business.

More than a half-billion dollars worth of office buildings have been placed under construction since 1947 in New York, according to the city's Department of Buildings. Most of it has gone into the Grand Central area. To make way for these new skyscrapers, the older, less profitable properties have had to be demolished.

• **Boom in office buildings**—From the sidewalk, you will also observe that the newer skyscrapers are different—they are bright and shiny, gleam in the sun. They clamor for attention. And this is not merely because they are new. The architecture is deliberately spectacular. An unconventional facade is one of several devices employed by the owners to attract tenants, since only a few of these buildings are occupied solely by one firm.

While the demand for office space in New York still is high, it is not easy to sign up tenants. For the new space is more expensive than the old and it is being augmented at a terrific rate. About 19,000,000 sq ft have been added since 1946.

The National Association of Building Owners and Managers estimates that office space in New York City totals close to 90,000,000 sq ft. And the Real Estate Board of New York figures that the amount of space now under construction or for which plans have been filed is more than 20% of this total.

With this vast amount of space now or soon to be available, every possible advantage must be exploited to draw tenants from old buildings in the city to the new ones and from outside areas to New York. And foremost among these advantages is the glamor and prestige associated with a location in a much publicized building in an area saturated with the headquarters of major branch offices of giant businesses.

This is not being overlooked by the owners of the new office buildings in the Grand Central area (roughly between 40th and 59th St. and Fifth and Lexington Ave. in Manhattan). There, you see buildings with all-glass facades, two-story exterior aluminum panels, stamped stainless steel, or bronze and pink-gray glass; skyscrapers that are completely air conditioned, brilliantly illuminated and acoustically treated inside; structures set back from the street to provide space for open-air gardens. Inside are luxurious, artistically decorated lobbies, high-speed automatic elevators that cut waiting and traveling

. . . New York's Spectacular Skyscrapers

WEST SIDE OF PARK AVE., looking south toward Grand Central from 57th St., features glass-walled Lever House (center) and 430 Park Ave. (foreground).

EAST SIDE OF PARK AVE., looking toward Grand Central highlights glass-walled 425 Park Ave. and the top of the steel frame of the House of Seagram. Nearly all of the structures between are scheduled to be replaced shortly.

time to a minimum, and plush sanitary facilities.

• **A close look**—To study these new buildings in more detail, let's start north from 42nd St. along Fifth Ave.

At 43rd St. you will encounter the first spectacular structure—the Manufacturers Trust Co. branch office, designed by Skidmore, Owings & Merrill and constructed by the George A. Fuller Co. This building, though only four stories high, has attracted considerable attention.

It is completely enclosed in glass on the street sides. Some of the panes are the largest ever rolled (ENR Jan. 14, 1954, p. 24). From Fifth Ave., the bank vault and the translighted ceiling in each story are plainly visible, the bright fluorescent lighting being particularly effective at night in drawing attention to the building.

• **Record steel frames**—On the next street north, you come to 530 Fifth Ave., designed by Voorhees, Walker, Smith & Smith and constructed by Starrett Bros. & Eken. This 26-story building, now in the finishing-touches stage, was of particular interest when its steel frame was being erected. For it is one of the tallest welded buildings in the world. (The record is held by the 30-story Continental National Bank Building, Ft. Worth, Texas).

All field connections, except for minor beams, were welded. For girder-to-column connections, seat angles were shop welded to the columns. In the field the girders were welded to the seats and a top plate was welded to both girders and columns, to take wind stresses. Welded plate girders, in pairs spanning 46 ft, were erected over a 2-story high bank where columns were undesirable. Dreier Structural Steel Co. fabricated and erected the 5,700-ton frame.

The 326-ft. high, air conditioned building, enclosed in white limestone, replaced a 17-story office building.

Continuing uptown on Fifth Ave., you soon see the steel frame of 666 Fifth Ave., between 52nd and 53rd St., which will be one of the tallest in the world with connections made with high-tensile steel bolts. The 38-story, air-conditioned building was designed by Carson & Lundin and is being built by Tishman Realty & Construction Co.

This skyscraper will have an unusual exterior. Under the windows in each story will be polished, anodized aluminum panels embossed with small squares. Mullions extending the height of the building, will consist of 20-in.-wide bands of white porcelain-enameled aluminum set in a frame of 3-in. wide polished aluminum.

In the interior, new-type movable steel partitions will be used to subdivide the space. The 3-in.-thick units will be insulated to deaden sound.

Skipping a block, you come to the excavation for Canada House. This air-conditioned 27-story building, designed by Eggers & Higgins and being built by Walsh Construction Co., will be set back 26 ft from Fifth Ave. Vertical lines of the steel-framed tower will be emphasized with limestone "fins."

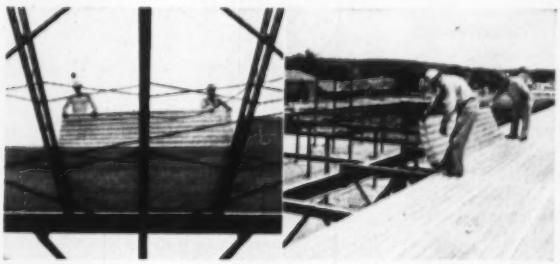
• **Buildings with unusual facades**—On the next block, you find the site of the 28-story Corning Glass tower, being designed by Harrison & Abramovitz and Abbe and for which the general contract has been awarded to the George A. Fuller Co. This air-conditioned skyscraper will be enclosed in

Engineers:
Hixson, Tarter & Associates, Cincinnati
Gen. Contractor: The Baldwin Company, Little Rock

MEN AT WORK...
beating construction time,
cutting days off production schedules

Thanks TO THESE 7 PLUS BENEFITS Kroger again "goes for" ZONOLITE®

CONCRETE *Poured-in-Place* OVER CORRUGATED METAL



View shows type of joist used in Kroger's Little Rock Distribution Center. Corrugated metal being placed over steel frame.

Welding metal deck in place. Placing Zonolite vermiculite concrete.

—the low cost...firesafe...lightweight INSULATING ROOF DECK SYSTEM

Now in Little Rock, as in other locations, The Kroger Co. employed Zonolite vermiculite concrete for its mammoth new Distribution Center.

Poured over corrugated metal, this system went on faster, is firesafe and delivers high insulating value... yet is low in cost. Engineers credit Zonolite concrete-corrugated metal with savings of $5,000 on this job alone, compared to the alternate specified!

Here are some of the benefits you can expect to derive from this
NEW-TYPE ECONOMICAL, BETTER PERFORMING ROOF SYSTEM

1. SPEEDY ERECTION—Skilled applicators apply Zonolite faster, cutting days off production schedule.

2. FIRESAFETY—Zonolite systems fire-tested by leading laboratories earn consistently high ratings.

3. LIGHTWEIGHT—Approximately 7½ lbs. per sq. ft.—eliminating many tons of dead-weight.

4. FLEXIBILITY—Zonolite is adaptable to any roof design—over corrugated steel, formboards, metal lath, paper-backed wire lath, metal deck.

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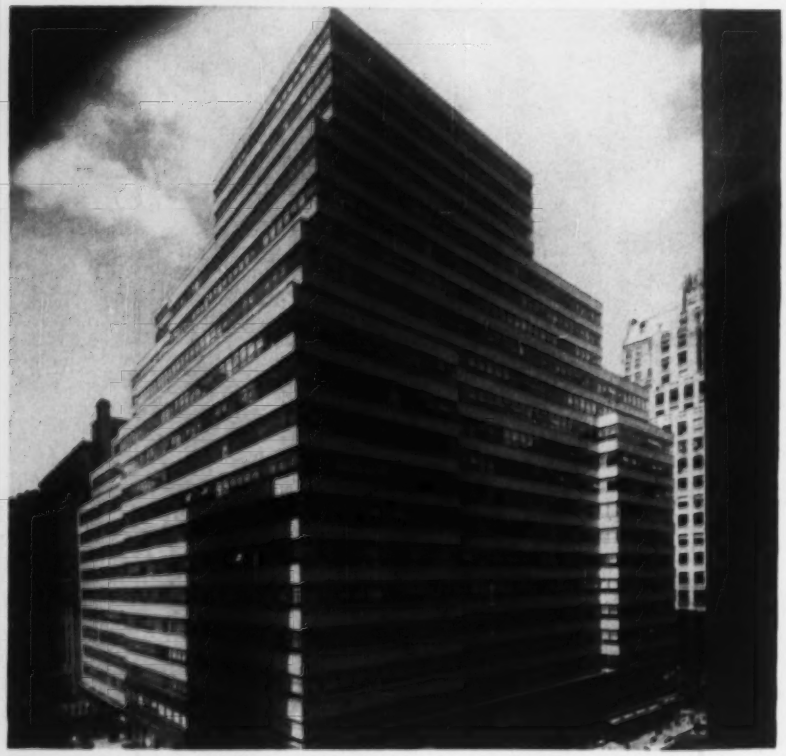


BRICK-WALLED BUILDING at 380 Madison Ave. replaced the 18-story Ritz-Carlton Hotel, which left a hole 45 ft deep, making foundation construction difficult.

glass and will be set back from the avenue in a landscaped plaza. To make way for it, the 12-story Hotel Langdon, built about 1904, and eight office buildings will be torn down.

If you go one block east at Central Park (59th St.), you see on your left at Madison Ave. the unusual exterior of the CIT building being put in place. The facade is black granite, set in a grid of stainless steel. (Use of the granite was made economical by recent improvements in cutting and polishing the stone.) It will have stainless steel windows, vertically pivoted. The air-conditioned 8-story building was designed by Harrison & Abramovitz and is being constructed by George A. Fuller Co.

Across the street, 635 Madison Ave., a 19-story air-conditioned building, designed by Emery Roth & Sons and being constructed by Joseph P. Blitz, is also receiving its facade. It will be mostly glass above a granite base, the spandrels being colored white. Aluminum mullions will emphasize the vertical lines of the structure. The entrance, trimmed with stainless steel, will lead to a lobby that will be lined with Italian marble and have a translighted ceiling.

Turning south, you pass at 55th St. a 17-story air-conditioned building completed in 1955. It also was designed by Emery Roth and built by Blitz. This structure, which replaced a 10-story apartment house, was enclosed with white masonry.

At 52nd St., you pass the 22-story Look building, which was finished in 1950.

Still farther south, at 46th St., you come to the 25-story office building at 375 Madison Ave. that replaced the old Parke-Bernet Galleries. The new skyscraper was occupied in 1951.

• **Replaced hotel leaves deep hole**—Across the street at 380 Madison Ave. is a 25-story brick-walled building completed in 1953. To make way for it, the 18-story Ritz-Carlton Hotel, built in 1910, was demolished. Because the hotel had four levels of cellar, extending 45 ft. below the street, construction of the foundations for the new skyscraper without allowing surrounding ground to collapse into the excavation presented a tough problem. The solution devised by the structural engineer, James Ruderman, kept the old basement exterior walls. Also, temporarily, part of the below-grade structural steel framing was left in place to brace the walls after demolition of the hotel.

The new skyscraper has concrete columns and beams up to and including the first floor. As each tier of concrete attained sufficient strength to pick up the lateral thrust on the walls, the old cellar steel was removed. Above the first floor is a riveted steel frame. Emery Roth & Sons were the architects and Uris Brothers, the builders.

Continuing south and then turning east on 40th St., you approach two relatively new skyscrapers at Park Ave. The 36-story one on your left (100 Park Ave.), with brick-faced piers and aluminum spandrels, was completed in 1951.

• **Two-story wall panels**—Diagonally across the street is 99 Park Ave., which attracted considerable attention in 1953 because of the speed with which its facade was put in place. Designed by Emery Roth & Sons and built by Tishman Realty & Construction Co., this 26-story office building was the first to be enclosed with two-story aluminum panels (ENR Aug 13, 1956). The enclosure job took 66 hours.

Heading north, you skirt Grand Central Terminal at 42nd St. and continuing on Park Ave. pass the Hotel Marguery, which now is being used as an office building. Demolition is soon to begin on this whole block—between 47th and 48th St. and Park and Madison Ave. to make way for a 45-story skyscraper being designed by Skidmore, Owings & Merrill for Union Carbide and Carbon Corp. Preliminary plans show a stainless steel facade.

• **Building straddles railroad**—One block north is the Colgate-Palmolive building, finished in 1955. This 25-story air-conditioned structure, designed by Emery Roth & Sons and built by Uris Brothers, has a glass exterior, with beige spandrels and aluminum mullions. It replaces an 18-story apartment house.

Foundations for the new skyscraper also presented structural engineer James Ruderman with a tough problem. For below grade are two levels of railroad tracks, both on a curve and on different alignments. There was a clearance under the first floor of only 6 ft, and construction of the foundations could not be permitted to interfere with railroad operations.

When computations showed that the existing bottom columns had sufficient capacity to carry the loads of the new office building, Ruderman found the solution to his problem in retaining them. However, a new problem was created because the column spacing above grade in the new structure could not be made the same as that below grade without loss of efficiency in use of office space.

The solution to this was to redistribute the load from the upper floors at the first and second floors. In the

end, only four new columns had to be erected in the railroad space. The foundations were completed without interrupting railroad operations or delaying construction of the new office building.

• **Unique building**—Continuing north on Park Ave., you soon begin to see the bolted steel frame of the 38-story, air-conditioned House of Seagram—probably the tallest in the world to be connected with the high-tensile fastener. It is set back from the street in what later will be a park-like plaza.

Bronze mullions extend vertically up the building around the exterior. And in the lower portion, bronze spandrels are being put in place. Later, pink-gray heat-absorbing glass will be installed from floor to ceiling in each story. And translighted ceilings will be installed around the perimetric areas to provide a uniformly illuminated exterior at night. Mies Van Der Rhoe and Philip Johnson are the architects, and George A. Fuller Co. is the general contractor.

On the next block is Lever House, completed in 1952, replacing the old Normandy Theater. Designed by Skidmore, Owings & Merrill and constructed by George A. Fuller Co., this 24-story, air-conditioned tower is enclosed with heat-absorbing glass set in stainless steel frames (ENR May 1, 1952, p. 79). The windows occupy more than half the exterior area in each story, and above and below them are blue wire-glass spandrels. The exterior is cleaned from a power-operated scaffold suspended from a rolling crane on the roof.

Across the street, the whole block, through to Lexington Ave., is to be cleared for Astor Plaza, designed by Carson & Lundin and to be constructed by George A. Fuller Co. Set back in a parklike area, as is the adjacent House of Seagram, the 46-story air-conditioned tower also will have a facade nearly all of glass.

Continuing north, you pass on the next block the foundations for a 17-story building and opposite it the steel frame of a 21-story office building and the site of still another skpscraper.

Between 55th and 56th St., you find a glass-walled 31-story air-conditioned building just completed. It was designed by Kahn & Jacobs and constructed by George A. Fuller Co.

Across the street at 430 Park Ave. you note a 17-story building not much older, with glass spandrels on the avenue side and brick on the street sides.

• **Speedy enclosure**—And at the corner of 57th St. and Park Ave. you see the 22-story office building that was enclosed with two-story aluminum panels in only 10 hours—between 6 a.m. and 4 p.m. June 21, 1954 (ENR July 1, 1954, p. 23). Designed by Emery Roth & Sons and built by Tishman Realty & Construction Co., it emulated the design of 99 Park Ave. because of the success in renting the earlier structure.

CORNING GLASS tower is scheduled for a Fifth Ave. corner.

ASTOR PLAZA is planned to occupy a whole block fronting on Park Ave.

• **Gold-colored building**—At this point, you may find it worthwhile to go one block east and turn south on Lexington Ave. If you do, you will find ready to rise out of the ground at 51st St. the steel frame for a 34-story air-conditioned office building that will have an unusual exterior. Spandrels and mullions will be gold-colored aluminum. Sylvan and Robert L. Bien are the architects, Minskoff & Sons, the builders.

At 47th St., you pass a 30-story skyscraper now being occupied. Designed by Emery Roth & Sons and built by Uris Brothers, it has a facade of dark gray aluminum and glass.

Then continuing south to 42nd St., you terminate the tour across the street from the famed Chrysler building. There stands the 45-story Socony-Mobil building sheathed in stainless steel (ENR Feb. 9, 1956, p. 33). Designed by Harrison & Ambramovitz and John B. Peterkin and built by Turner Construction Co., it was completed last year.

• **Why the boom in Grand Central?**—By this time, you are probably wondering: "Why is so much office-building construction taking place in the Grand Central area rather than on the West Side where rents are less or downtown around Wall St?"

Here is the opinion of Edmond E. Thomas, vice president of the Real Estate Board of New York and a partner in Brooks, Harvey & Co., mortgage brokers:

"The builders of office buildings have done more construction in the Grand Central area since the war than in any other area of the city for very sound reasons. The most important is the area's superior transportation facilities—the New York Central and New Haven Railroad terminal, and stations of three subway lines.

"Next in importance is the prestige of the area, which confers on those who tenant the new buildings the glamor that really pays off in American businesses.

"Perhaps the most startling aspect of the new construction since the end of World War II has been the transformation of Park Ave. from Grand Central Terminal north to 60th St., from the Gold Coast of luxury living to the Gold Coast of corporation headquarters. Two factors produced it

"1. The need of the corporations to have space with the facilities of the Grand Central area.

"2. The inability of the owners of the apartment buildings to raise rents, because of rent control, to get anything near the same return from their holdings that was derivable from office buildings.

"After World War II, corporations in midtown had need to expand, and the large corporations in the financial district simply had to have more space than was available to them in their downtown offices. They moved to the Grand Central area because that was the first space available. Now builders downtown are creating new space there. Nevertheless, the downtown space is limited, since Manhattan becomes a very narrow island as it approaches the Battery."

So the boom in Grand Central continues.

Concerned over growing number of new septic tanks and cesspools ENR solicits experts' views on program of . . .

Laterals Now, Trunks Later

- **In areas sure to require central facilities in short time**
- **With dead-end sewers or small treatment plants in interim**
- **And how communities might implement such programs**

The conferees pictured below gathered together at breakfast in Los Angeles October 10. The conference was moderated by Arthur J. Fox, Jr., Senior Editor, Engineering News-Record.

• *MODERATOR:* Gentlemen, we are sure you share our concern over the ever increasing number of septic tank and cesspool installations in new subdivisions located in areas reasonably certain to require sewers within a relatively short time. The problem and different solutions have been much in the news recently. Marple Township, a suburb of Philadelphia, recently won in court its right to require a subdivider to install sewers and cap them in anticipation of an interceptor. Just the other day Cleveland refused to extend water service to new developments in its septic tank belt until proper disposal facilities are installed. Florida has its well-known installations by homebuilders of community sewage treatment plants. Our intent here is to explore such questions as the desirability of installing lateral sewers at the time the subdivision is built if no trunk lines are available, what type of local treatment is necessary until a central system is achieved, the problems of operating small plants and how communities might implement such programs.

BACON: I take it that you feel that if we are going to have sewers eventually, we might as well have the sewer now whether it is dry or wet. Say you build a sewer, and then you go ahead and build a treatment plant rather than have individual cesspools and septic tanks. I think that is important. Where you have the sewers, why then build a septic tank. It would be more economical and guarantee a better system by going ahead and putting in the treatment plant. I am impressed with the idea of stage construction where you are not building something that is classified as temporary. Sometimes holding out for a metropolitan system is the beginning, as most of us know, of cesspools and septic tanks. We have found that to be true. Stage construction is more realistic—rather than striving for a metropolitan district at the beginning. It just doesn't come except in the rare instances of some subdivisions, and then the subdivisions aren't close enough together.

What's being done

BAUER: In the San Fernando Valley here in California, the Federal Housing Authority goes along with a local ordinance that certain housing areas must put in sewers. The trunk lines are not available now but they are in the process of being built. We let them set up so that the sewers can be connected once the trunk lines are available. In the meantime, we allow septic tanks or seepage pits in that area.

The Conferees

Vinton W. Bacon
Successful leader of abatement effort as director of California Water Pollution Control Board

Ivan W. Bauer
Federal Housing Administration's area sanitary engineer out of Los Angeles office

Robert Gloppen
Sanitary engineer with Yeomans Brothers Co. and one of the prime movers in small plant design

Harold B. Gotaas
Sanitary engineer and teacher, recently named engineering dean of Northwest Technological Institute

WILKEN: Veterans Administration goes along with the principle Mr. Bauer cited as a forward step toward development of central sewage disposal systems.

• *MODERATOR:* How long has that been practiced?

WILKEN: I would say for the last five or six years it has been a common practice to anticipate the ultimate development of these trunk lines for such places as Orange County.

LEE: Then, the cost can be figured in with a VA loan?

WILKEN: It can be figured in through FHA.

WAKEFIELD: We have had this problem of attempting to provide sewers for what we call interim periods until adequate facilities are available from municipalities. We have that situation in practically every subdivision built in Florida. There are 200- or 250-house tracts, and if they are served by septic tanks, you add the cost of putting the tank in and you can pay the cost of putting in a small community sewage treatment plant.

Now, I know of a lot of people who have many qualms about privately owned plants; we do, too. We don't think it is ideal by any means, but we have them. Their operation is about the same as we would get from a comparably-sized municipality. Some are good and some are bad and most of them are in the middle.

The city of St. Petersburg has handled the situation in an excellent manner. It had plans and actually put them into effect to extend interceptors to cover the whole city. But before this, developers in St. Petersburg in several cases constructed independent sewage disposal systems with small treatment plants. The city took over operation of these plants immediately and reimbursed the developers for sewers out of income from sewer rentals. After the interceptors got out there, the plants themselves were not needed any more and were given back to the developer. Presumably, they got the cost of the plants out of the increased value of the property.

WILKEN: What would you consider a minimum-sized subdivision to justify a sewage treatment plant?

WAKEFIELD: We have been doing it down there with 38 houses. They probably didn't even break even. When they have 250 or 300 houses, they can break even. When they are bigger than that, they can make a little money out of it. We have some utility developing people—not homebuilders—providing sewers and treatment plants for homebuilders. The buyer of the house is required to pay a $50 connection fee. The builder pays $150 a house to the utility developer, who with this can build most of the plant and get the rest out in sewer rentals of from $2 to $2.50 a month.

WILKEN: Under whose jurisdiction are these treatment plants?

WAKEFIELD: They are under the jurisdiction of the State Board of Health, if not in a city.

BAUER: Have they started any so-called package plants?

WAKEFIELD: Lots of them.

WILKEN: How are the rates set?

WAKEFIELD: Usually, by the Veterans Administration or the FHA.

• *MODERATOR:* Mr. Gloppen, how much of an influence has the package plant had on your business?

GLOPPEN: Before I answer, we call them "small" plants. How they ever got that name "package" we will never know, but we are still living it down after all these years. But to answer your question, it has had a terrific impact. Ten years ago we were involved in reasonably large municipal plants most of the time, and subdivision plants were the exception. Today that situation is reversed.

Small plant problems

• *MODERATOR:* We assume with these independent treatment plants there is a place for the effluents. Yet sometimes you have to stretch pretty hard to make it available. In some cases, the course is practically a dry ditch.

BACON: Around our area, we have agreat number of dry creeks. If a subdivider builds his private plant, you have a water course. You can't exclude the public from this. If you discharge the effluent into that course, you would be forced to go into secondary treatment to maintain that little creek created of effluents. You would be making the cost prohibitive if you did that, because the difference between a good effluent and one that children could be exposed to would probably run up the cost two or three times.

VELZY: Today, development on Long Island is septic tanks and cesspools for the most part. These work for a relatively long time there. However, we have developed sewer systems for a couple of builders in the last year where an outlet became available. But a separate system, even with a separate treatment plant, is not a good answer in most instances because there is no outlet for it. There

Thomas B. Lee
On the firing line as Department of Public Works engineer for city of Nashville, Tenn.

Charles R. Velzy
Consulting engineer of New York and long experienced with Long Island's cesspools

John W. Wakefield
Administers Florida's private treatment plants as State Board of Health sanitary engineer

Arnold A. Wilken
Veterans Administration Los Angeles loan guarantee officer has advice for pollution abaters

are no streams of any consequence. There is a definite retardation of building in spots because there is not an adequate answer to this problem, although so far, Long Island is still building.

GOTAAS: Forget about the outlets and the open ditches and so on and set aside in each area a certain area for a park development in the future which would first be a site for a small treatment plant. You may have a small primary plant or a primary and secondary plant with a stabilization pond or leeching set-up in this large area—maybe three blocks—and you can run out four lines. This would revert to a lovely park in the area when the interceptors were constructed. If you sit down and figure the economics of this, in many instances you would find it a great deal more economical in the long pull to go ahead with the sewers and the development of that kind rather than fuss with septic tanks.

BACON: There is another practical problem that we are faced with in connection with building dry or wet laterals—the main collection sewer within the subdivision. When these are eventually tied into, it is obvious that in the closer subdivision maybe instead of an 8-in. collection line it should be a 12-in. sewer. In California, we have a practical means of getting the subdivider to put in the extra capacity in which he is repaid at a later date.

VELZY: How the small plant is going to be operated is another problem. The over-worked public officials of New York City hesitate to take on operating a number of small plants. They certainly are not staffed for it now, so in one case, that has been the real block to construction. The builders are willing to put in the sewers. They are willing to build the plants. They are willing to put the money for the operation, but who is going to be responsible for that operation?

WAKEFIELD: Practically all of the systems in Florida are privately operated at the present time and the practicality of the operation, I think, can be judged by the fact that the larger subdivisions have syphoned some of the best operators we have—including some of the sanitary engineers who worked for the State Board of Health. They are willing to pay more money.

VELZY: You spoke about these privately owned plants being well operated. Do they come under the jurisdiction of the town or the city?

WAKEFIED: Most of them are in the county and the county hasn't seen fit to set up a control over them.

VELZY: They are going on their own?

WAKEFIELD: The only supervision they have at the present time is the State Board of Health through the County Health Departments.

VELZY: What do you do if it falls down? You can't shut it off.

WAKEFIELD: If the subdivision is growing, we don't let them put any more houses in there until it is straightened out. Legally, I think, we could take them over and operate them.

VELZY: Some government agency would have to take such a unit over to be sure it is properly operated, I think.

WAKEFIELD: I agree with you.

The cost picture

• *MODERATOR*: I wonder if anyone has any of the actual expense figures involved. It is important from the ultimate cost angle. If a builder is putting in septic tanks in back yards, it may be a good long time before you get a collection system. If a builder is required to put in sewers it may be a lot easier to get the interceptor and treatment plant to follow in a shorter period of time. The installation of the laterals might be the impetus needed.

BACON: I think if you put the sewers in when the tract is first going in, all of your construction costs will be cheaper. If you were at the edge of a subdivision where you wouldn't have to consider outfalls or things like that, what would be the cost per capita for a small package plant for 200 families? I think that we are considering secondary treatment here.

GLOPPEN: We use a crude rule of thumb in considering costs on the so-called package. We just figure it is in the neighborhood of $1 a gallon.

BACON: For a 150-gallon per capita sewage plant, it would be $150 per capita for construction? That makes a good case for the small plant rather than a cesspool.

WAKEFIELD: And that would increase the value of the house $150. Now, would FHA and VA recognize that increased value with a dry sewer in front of the house?

BAUER: Any lot is given increased value if it is sewered.

WAKEFIELD: You are not connected to the sewer. You have a septic tank. Are you still going to recognize that?

WILKEN: The VA would have to.

WAKEFIELD: Some developers say you don't.

WILKEN: They do; we don't.

• *MODERATOR*: We know in the Pennsylvania township the dead-end sewer ordinance was upheld. Where else would it be applicable?

BACON: I think wherever you can foresee in a metropolitan area that the trunk sewer system will be available, it probably will become applicable. I have no doubt that the system has a lot of merit but it is a matter of timing. If you can't see the trunk sewer for 20 years, you would have a difficult time making the demand stick to cap laterals.

BAUER: The reason we would require that they install the dry sewers would be to get away from the much higher expense of doing it within a couple of years.

VELZY: In a study I recently made on Staten Island within New York City on 85 houses, indications were that installation of sewers and a small plant would cost less than putting in a septic tank for each house. When you consider that maybe within five or ten years, those houses would have to be sewered anyhow, then your balance certainly is in favor of putting in the sewers early.

• *MODERATOR*: Were you stumped by the operation problem?

VELZY: That is true.

Getting the ball rolling

GOTAAS: It seems to me that the whole problem gets back to a matter of planning. That is the crux of the thing. The thing is largely to get some sort of a plan for these larger areas so that the small increments can tie in. I think we have missed the boat.

WAKEFIELD: Two years ago, our state legislature passed an enabling act which permits the counties to create sanitary districts. So far, we haven't created any.

LEE: I would like to second that point of integrated systems to fall into an overall plan. I know where we have accepted these partial solutions and temporary solutions they are still not integrated in the system properly.

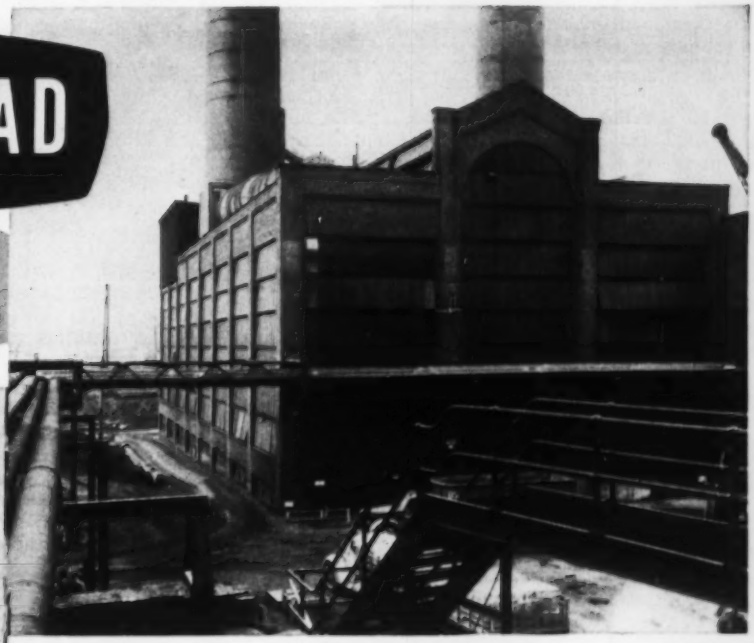
• *MODERATOR*: That brings up the question of where the initiative should lie.

WAKEFIELD: We feel very strongly about this mass

OVERHEAD

OR

underground



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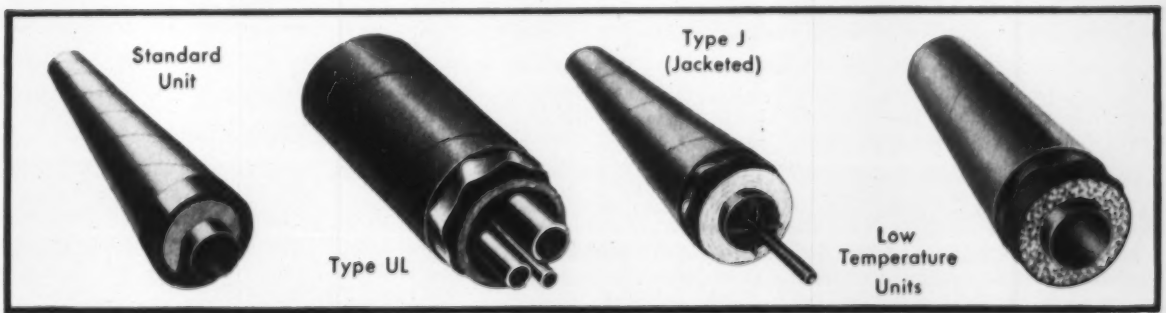

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building being stimulated by availability of FHA and VA guaranteed loans. We feel if the federal government is going to stimulate mass building, they should stimulate the sanitary facilities.

GOTAAS: As far as enabling legislation is concerned, it seems to me that it gets back to the county, or whatever the local unit is, being farsighted enough. For example, within 20 years it is expected that most of Marin County (California) will be built up, and they are sort of zoning under a general planning program, but they are not doing a thing about sewers or even the water supply.

WAKEFIELD: That is the problem we have. The City of Jacksonville has worked up a very nice metropolitan sewer plan but it isn't contemplated in this area until 10 years from now. The developer wants it there now. The people are not going to sit around and wait for that.

BACON: We are sometimes rather harsh with planning commissioners. It is nice to say that we should plan Marin County as we would like to see other areas planned and provide for these trunk sewers and say that all developments should start feeding out from that today. That isn't practical. It is contrary to our system. As a result of its not going through, we sometimes jump on the planners. Actually, you cannot very well control a plan like that.

GOTAAS: The point that I was trying to make is that any master plan should be extremely flexible.

WAKEFIELD: I know it isn't easy, but if you have governmental authority, whether it be on the county or city or whatever level, who will face the responsibility, it can be licked.

BACON: I say "Amen!" I say that because we have in California a tremendous problem. The subdivider is getting off the job. Certain units of government are very reluctant to use the statutes we have to form sewer maintenance districts and to put the operators in there and to take over. I don't think that you can bind the subdividers for the next 100 years to operate a plant.

VELZY: I am very much interested in that reaction because that does not exist in the New York metropolitan area at the present time. I don't blame the public officials. At the moment they are not staffed for it.

WILKEN: I would like to suggest your efforts be directed to sell the subdividers and builders the principle that it will cost them less and enable them to sell more houses to set up these small plants rather than install individual septic tanks. But most important, I think there is some missionary work to be done in carrying forth the principle of the responsibility of government in matters of this kind. To my notion, that starts with stating these things to the state and going down to the county and cities. This is a long-range plan and if the local communities are not going to take the responsibility or the authority, at least they could do more along the lines of simply going out and encouraging the establishment of these individual treatment plants and then, offering to take over the operation and management of them to overcome a lot of objections that are inherent.

BACON: In the past there has been a little reluctance towards these small type of plants because of our fear of operational difficulties, and secondly, that the small plant has to be located near the community because it can't afford a long outfall. There is a definite school of thought that believes the sewage treatment should be as far away from the community as possible. That might be a fine subject for discussion—the philosophy of the remote location or close to the community. I am very strongly in favor of putting a sewage treatment plant right in the heart of the city.

WAKEFIELD: I would put the plants in the City Hall.

BACON: I think the mayor's front yard is the best place for them.

• *MODERATOR:* You gentlemen have been most cooperative with your comments. We have covered a great many points here, and from various angles. I don't think the subject or nature of our conference required that we come up with a single answer or conclusion. Let me sum up simply by saying that you have shed light on many points that certainly seem to make a good case for the idea of "sewers now, trunks later". You have discussed examples of this idea and its economics; the small treatment plant and its operation; stage construction and its relation to good planning. You have said much that will be of interest to the readers of ENR. Thank you.

Sudanese Push For Their Own Nile Project

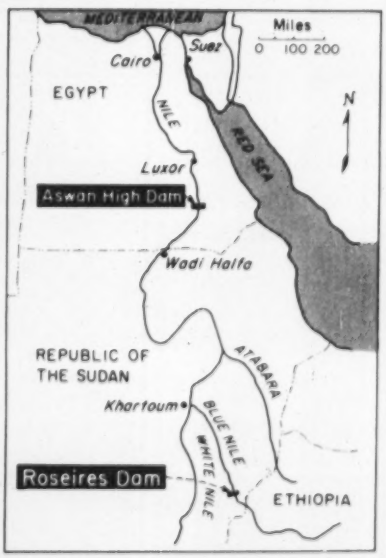
Sudan's Roseires Dam project, on the Blue Nile close to the Ethiopian border, is again being weighed by the Sudanese, who feel they cannot wait indefinitely while Egypt makes up its mind about Aswan High Dam.

The $60-million Roseires scheme would take seven years to complete and would give the Sudan valuable hydroelectric power.

However, should the Sudanese go ahead with their plans—bids will be invited early this year, according to some reports—Egypt may object and even claim the right to veto the scheme. To do so, it would probably refer to the 1929 Nile Waters Agreement, though Sudanese argue that the agreement was signed by Britain and Egypt and not by the newly independent Republic of the Sudan. Also, although Sudan has repeatedly demanded to be consulted on Aswan High Dam, it has been ignored by Egypt.

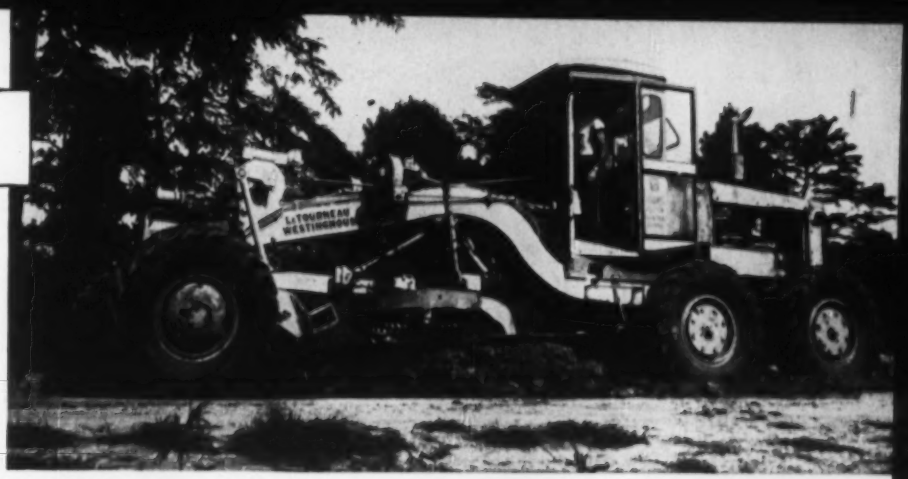
One of the staunchest supporters of the Roseires scheme is the minister of irrigation and electric power in the coalition cabinet of Sudan. Minister Hamza, according to information from Khartoum, is slated to have talks soon with the British firm of Sir Alexander Gibb & Partners, and the French firm of Andre Coyne. The British firm is the one whose contract for Aswan High Dam was cancelled by the Egyptians after Egypt nationalized the Suez Canal.

In the meantime, Egyptian newspapers are keeping Aswan alive by reporting proposals made by the West German firms of Krupp and Demag to build Aswan High Dam without any government participation.

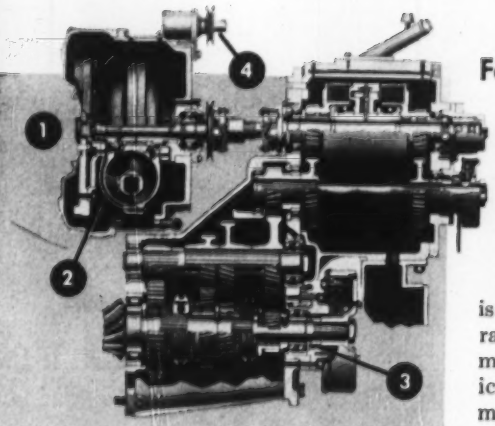


ROSEIRES DAM on the Blue Nile is weighed by Sudanese who fret over Egypt's ▶ delay on Aswan High Dam.

190 HP



NEW POWER-Flow Adams 660
with Torque Converter



1. 190 hp Cummins or General Motors Diesel Engine (not shown).

2. Torque Converter — Adams single-stage type. Multiplies torque 3-to-1—provides infinite gear ratios—absorbs shock loads to prevent engine lugging or stalling.

3. Constant-Mesh Transmission—with power clutch for forward-to-reverse motion without shifting — 4 speeds forward to 27.4 mph, 4 reverse to 24.4 mph.

4. Tail-Shaft Governor—adjusts engine speed automatically to maintain constant grader speed preselected by the operator.

Forward speed to 27.4 mph — reverse to 24.4

New POWER-*Flow* Adams 660 works at all times at fastest possible speed and highest efficiency. Its torque converter automatically balances speed and applied power to match the load. Engine torque is multiplied 3-to-1 in infinite gear ratios. Tail-shaft governor supplements torque converter by automatically adjusting engine speed to match variable load conditions.

This maximum flexibility in power transfer provides a cushion against load shock, reduces wear and maintenance on engine and transmission. When bucking varying heavy loads, frequent gear-shifting is eliminated . . . no engine stalling. Operators get *more* work done — with *less* effort.

Shift forward to reverse with simple foot control

Adams power-shift clutch shifts instantly in any gear range — from forward to reverse, reverse to forward — with the simple movement of a foot pedal. This leaves operator's hands free for steering and for more accurate control of blade.

POWER-*Flow* "660" offers many extra advantages:

Power Steering — gives the "feel" of hand steering, with hydraulic power doing the work.

Double-Action Hydraulic Braking System — applies pressure to brake on transmission as well as to brakes of 4 tandem drive-wheels.

Engine Rubber-Mounted—with no vibration transmitted to machine. Reduces operator fatigue.

Foot Accelerator — makes driving on highways and through traffic as safe and easy as driving a truck.

Six Big Tires — 14.00 x 24 — adequate traction and flotation for work in any material or footing.

Slide-Shift Moldboard — shifts easily, right or left, for long reaches.

Optional Equipment — includes Power-Shift Moldboard, Scarifier, Cab, Bulldozer, Elegrader, V-type Snow-Plow and/or Wing, Snow-Blo Wing, and Rotary Snow-Plow.

Look into POWER-*Flow* Adams 660

See how this fast, 190 hp grader can help keep your heavy work ahead of schedule. *Write for details.*

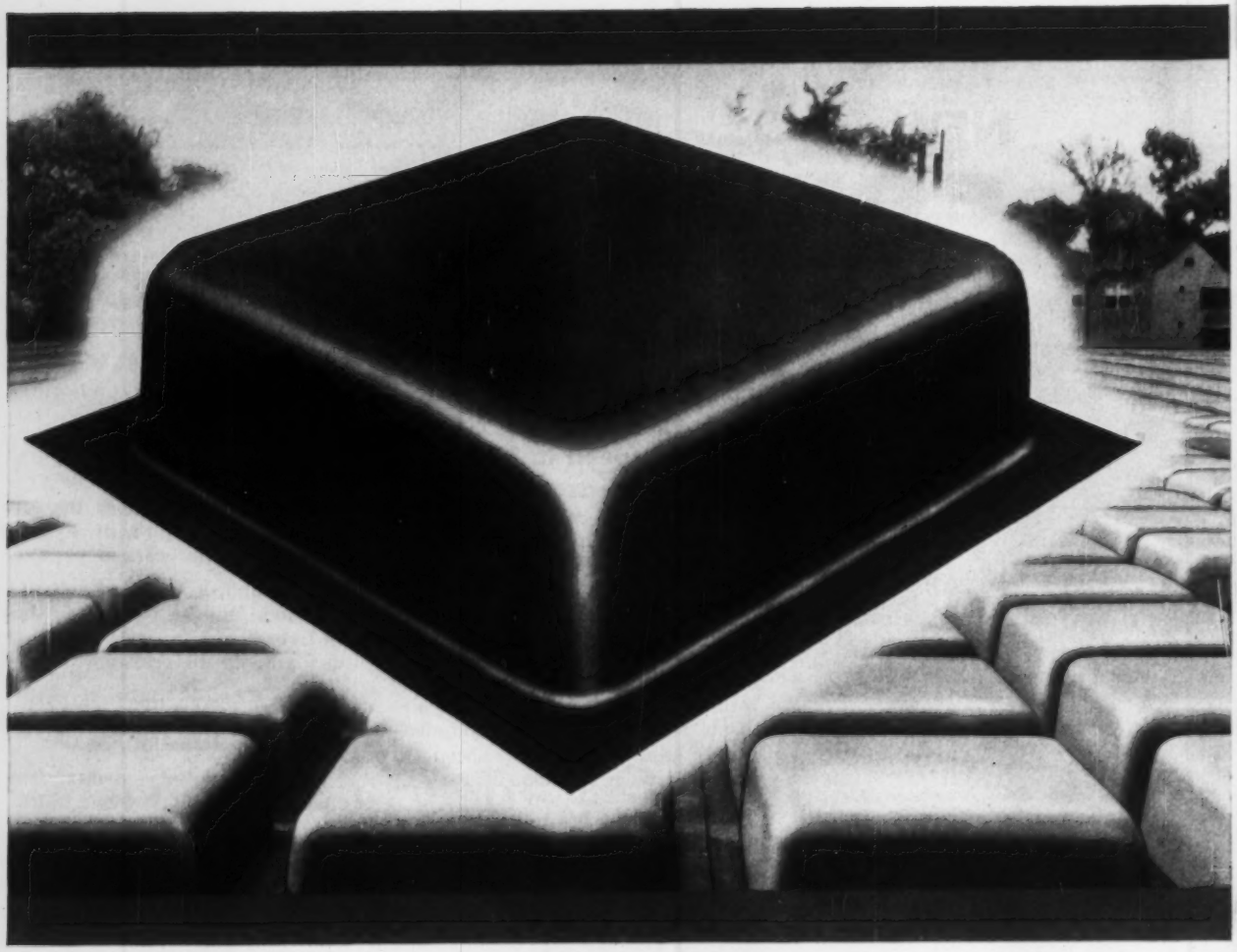
Adams, POWER-Flow—Trademark AG-1262-G-b-6

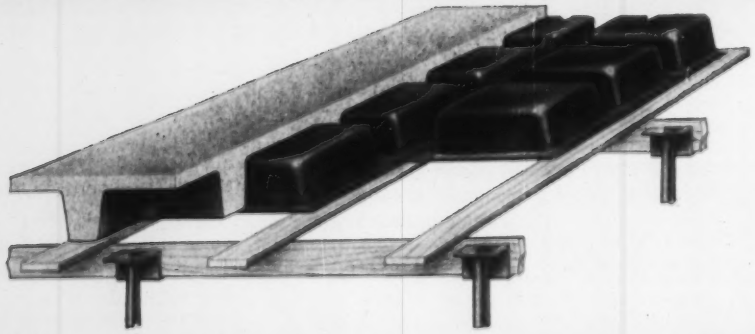
LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

WIDE OPEN *SPACES...*





Showing how Steeldomes are used in forming waffle-type (two-way) concrete joist construction. Steeldomes are rigid, deep-drawn, one-piece units. Flanges forming standard-width joist soffits are an integral part of the Steeldomes. When erected Steeldomes are butted at all soffit joints, and eliminate the common defects of forms which must be lapped. Wide column spacings for open floor areas are easily achieved, because of (a) the basic economy of two-way construction, and (b) the saving of dead-load through use of a joist framing system. Story heights are decreased by the elimination of deep beams. Standard Steeldomes have a void of 30" x 30" and an overall plan size of 36" x 36" including flanges. Standard depths are 8", 10", 12", and 14".

WITH ECONOMY...FOR TODAY'S CONSTRUCTION

...ALL MADE POSSIBLE WITH THE NEW CECO-MEYER ONE-PIECE STEELDOME METHOD OF FORMING WAFFLE-TYPE CONCRETE JOIST FLOOR SYSTEMS

Maximum use of floor space is a must in today's functional buildings. And the most practical way to design wide open floor areas . . . with no projecting beams . . . is by using waffle-type concrete joist construction formed with Ceco-Meyer one-piece Steeldomes. The new Ceco method is the most economical way of forming waffle-type concrete joist construction. In most cases you save up to 30% in materials . . . up to 40% in floor weight compared with the use of flat plate. Besides saving money, labor and materials, Ceco Steeldomes form smooth concrete surfaces for exposed ceilings of high quality finish—pleasing waffle-pattern design at no extra cost. R/C duct underfloor electrification may be readily installed—and pipes, ducts and other mechanical equipment can be located without interference of projecting beams. In planning your next building project, call in your Ceco product specialists.

CECO STEEL PRODUCTS CORPORATION

Offices, warehouses and fabricating plants in principal cities
General Offices: 5601 West 26th Street, Chicago 50, Illinois

IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE

Ceco-Meyer Steelforms / Concrete Reinforcing / Steel Joists / Metal Roof Deck / Windows, Screens and Doors / Metal Lath

CECO STEEL

"CREATIVE ENGINEERING" BY CECO—with a variety of building methods and products to meet any design problem. See CECO in the early planning stage for Steel or Concrete Joist Floor Systems—the most economical underfloor electrification—the widest line of Steel and Aluminum Windows and Curtainwalls. All will help you achieve individuality in building design. And at CECO construction materials and services can fit the tightest budget.

CECO STEEL PRODUCTS CORPORATION
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Please send me your descriptive bulletin on Ceco Steeldomes, No. 4006.

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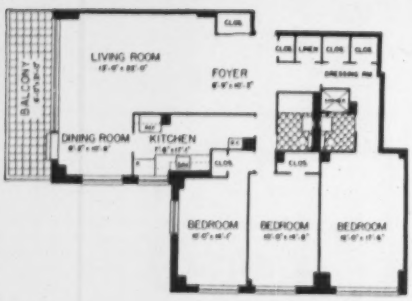
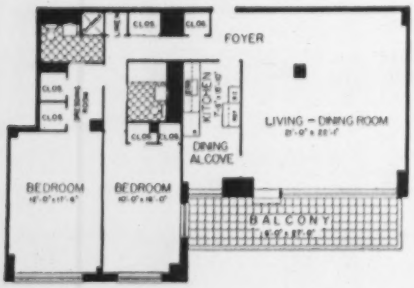
ENR



The floor plan above shows a typical three-bedroom apartment in Highpoint. The floor plan below shows a typical two-bedroom apartment. Owner and builder of Highpoint: Charles Kibel; architect: Henry Kibel; engineer: Greenhut & Taffel. All are from New York City.



CONCRETE FRAMES AND FLOORS

. . . quality construction for modern apartment buildings

Here is reinforced concrete frame and floor construction adapted to a modern apartment house—Highpoint—in New York City. Its 16 floors provide 126 apartments and a penthouse. A 130-car garage is adjacent. A unique feature is the cantilevered floors at either end of the building to provide outside balconies.

There are many reasons for the growing popularity of concrete frame and floor construction. It offers great strength, unusual durability, firesafety and economy. Its moderate first cost, low maintenance cost and long life add up to ***low annual cost,*** which pleases owners and investors. And competitive bids show that this method saves up to 40% on frame and floor cost.

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PORTLAND CEMENT ASSOCIATION

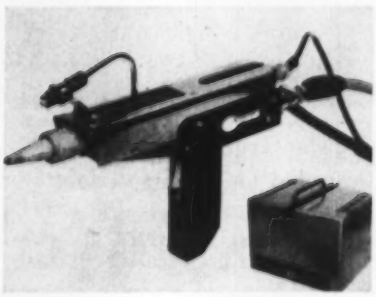
Dept. A1c-17, 33 West Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

Telescopic Hoist for Fast Dumping

A new single front-mounted telescopic hoist said to be capable of raising and dumping in less than six seconds has been developed.

Known as Model 1215, the new 5-in. dia telescopic hoist has been designed for use on high-speed batching operations or other areas where fast dumping action is essential. The manufacturer claims that the hoist will raise to full dump position in six seconds, and accelerating the truck engine at the top of the stroke provides a rapid 4 to 10 in. rising and falling motion of the body for fast dumping. Hercules Steel Products Co., Galion, Ohio.



Ultrasonic Soldering Tool For Aluminum Needs No Flux

An ultrasonic soldering tool, capable of soldering aluminum without flux, has been introduced in the U. S. The tool, with its accompanying power unit, is made in England by Mullard, Ltd.

High frequency sound waves are applied through molten solder to the surface of the aluminum or other light metal. A "cold boiling" effect, called cavitation, is produced within the solder. The cavitation bubbles completely remove all oxide film from the metal surface, allowing a wetting action by the solder. Thus, tinning takes place without any flux.

The soldering tool has a pistol grip and can be supplied with a choice of either a chisel-shaped or tapered copper bit. Features claimed for it include a built-in bit heating element, no frequency drift, quiet operation and ease of handling. It weighs only 2 lb. The American licensee gives a 90-day guarantee on the equipment and provides repair service and parts replacements anywhere in the U. S.

Applications of ultrasonic soldering include tabs for aluminum transformers and sealing aluminum cases. Acoustica Associates, Inc., Glenwood Landing, N. Y.

Electric-Powered Pump Moves 1,440 gph at 24-ft Head

An electrically driven, close-coupled portable pump is capable of discharges of 1,440 gal per hr at 24-ft head, according to the manufacturer.

This newest addition to the Barnes self-priming centrifugal pump line is lightweight and features a discharge outlet designed for use with standard garden hose. The pump is connected to a ½-hp motor operating on 115 v and delivering 3,450 rpm.

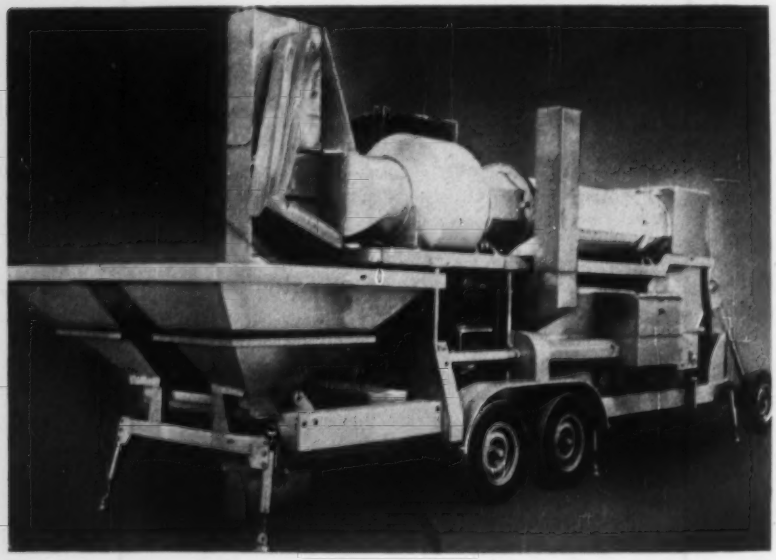
The Model 1MAE can be used for spraying, filling, circulating and water pressure boosting, in addition to draining, the maker states. Barnes Mfg. Co., Mansfield, Ohio.

Higher Speeds Offered on New Earth-Boring Auger

Boring speeds have been increased as much as 40% on the latest Hydrauger horizontal earth-boring machines, according to the manufacturer.

The machine is a wet hole borer, i.e., water, forced through the hollow steel boring bar sections cools the cutting bit, washes cuttings from the hole and muds the hole walls.

The straight, open hole produced by the machine allows installation of many kinds of pipe. The larger machines bore holes of 2 to 24 in. in dia for distances of up to 250 ft. Hydrauger Corp., Ltd., 681 Market St., San Francisco 5, Calif.



Asphalt Plant for Small Contractor

Built especially to meet the requirements of the small paving contractor is the new Wylie Model 1520 Roadmaster plant.

According to the manufacturer, the machine delivers hot asphalt mix at the rate of 15 to 20 tons per hr. This new paving plant is self-contained and completely mobile.

Twin aggregate hoppers hold more than a cubic yard of material each and with the reciprocating plate feeder, coarse and fine aggregates are fed accurately into the elevator boot in the desired amounts.

After the aggregate has passed through the rotary dryer it then enters a weight-controlled aggregate batcher and in turn is discharged simultaneously with a required proportion of hot asphalt into the twin-shaft pugmill. Wylie Manufacturing Co., Inc., P. O. Box 7086, Oklahoma City, Okla.

Multipurpose Attachment for Payloaders

Frank G. Hough Co. has announced that its entire line of four-wheel drive Payloader tractor shovels will now offer Drott "4-in-1" buckets as optional equipment.

The multipurpose attachment previously has been made available only on the crawler models of the International-Harvester line of equipment.

The new bucket attachment can be used as a shovel, a clamshell, a scraper, or as a bulldozer.

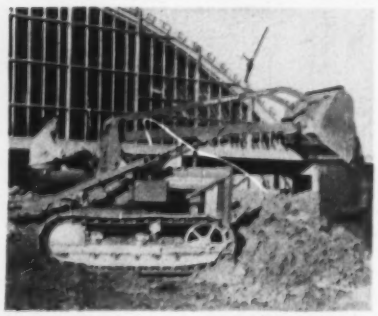
Frank G. Hough Co., 722 Seventh St., Libertyville, Ill.

Anodized Finish Reduces Garage-Door Maintenance

An aluminum door, marketed by the Overhead Door Corp., is claimed to have an almost maintenance-free life span. An anodized finish inside and out reduces the cost of painting usually required every two years by ordinary doors.

Called the Panoramic, because of its greater see-through vision, the door is suitable for not only service stations but can also be installed as shopping center fronts, swimming pool enclosures and even chick hatcheries. Its initial cost is approximately 20% greater than that of a wood door.

No welding, struts or trusses are used on the Panoramic door. Extruded tubular aluminum stiles, rails and muntins, together with a new type of reinforcing fin, create a built-in strength that eliminates the need for steel reinforcement. It is said to be exceptionally light in weight and easy to open and close. Overhead Door Co., Hartford City, Indiana.



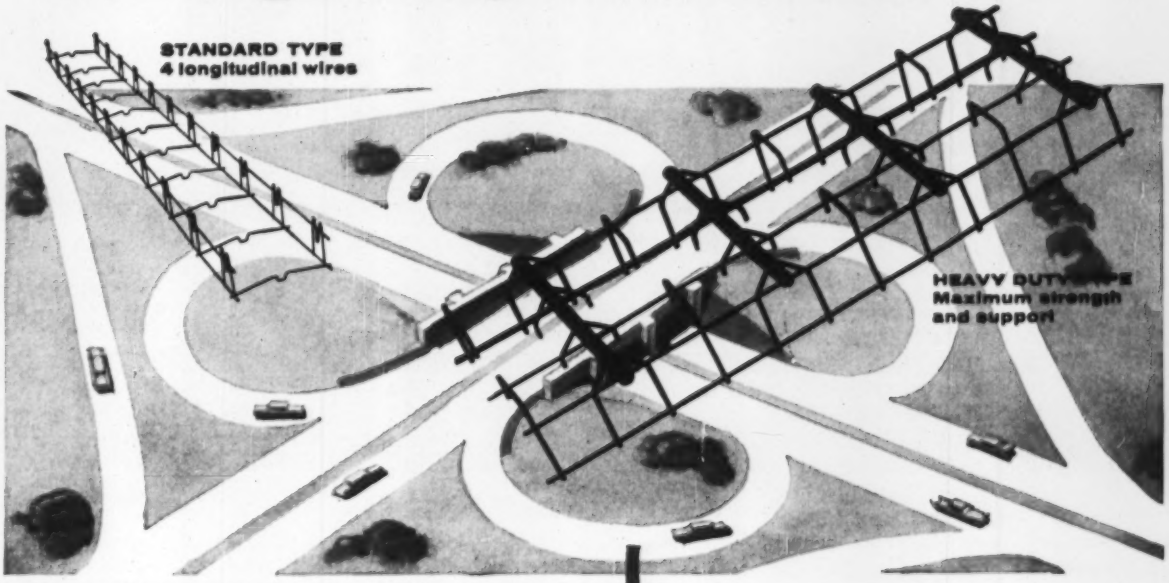
Crawler Tractor-Shovel Is Designed for the Small Jobs

A new crawler-loader with a 30 hp engine and a $\frac{5}{8}$ cu yd struck or $\frac{7}{8}$ cu yd heaped bucket has been announced by John Deere.

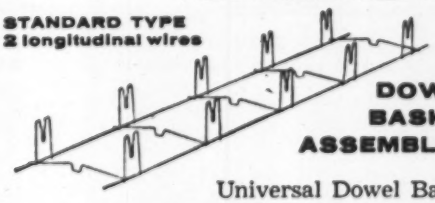
The crawler-loader is constructed so that a backhoe may be mounted in conjunction.

The heavy formed-steel loader frame is mounted directly onto the square crossbars of the crawler prime mover, to place the load squarely on both tracks. The bucket has a reversible, hardened steel cutting edge and replaceable teeth. Two heavy-duty hydraulic cylinders raise the bucket and two others dump the bucket. Bucket break-away lift at ground level is 4,500 lb. The loader lifts 2,700 lb to dumping height of 10 ft, 6 in., according to the manufacturer. John Deere Industrial Div., Moline, Ill.

UNIVERSAL PRODUCTS
for highway construction



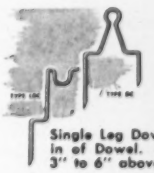
STANDARD TYPE
2 longitudinal wires



DOWEL BASKET ASSEMBLIES

Universal Dowel Basket Assemblies are designed and fabricated to specifications. Special equipment and fixtures guarantee accurate spacing and positive alignment of dowels. High speed production equipment and modern facilities insure prompt delivery of your requirements. Universal Baskets are approved by Federal, State and private authorities for highway and airport construction.

Let us quote on your requirements. Write for complete details today.



INDIVIDUAL DOWEL CHAIRS

Two-legged dowel chair holds dowel in 2 positions. Easily pushed into sub-grade—won't turn after installation. Wide range of heights.

Single Leg Dowel Chair permits quick snap-in of Dowel. Sizes to support Dowel from 3" to 6" above sub-grade.

STAKE PINS

Keep Dowel Bar Assemblies in place during the pour. Lengths from 4" to 15" in ¼" increments.

DOWEL SLEEVES

Metal Dowel Sleeves for covering ¾" Dowel Bars; overall length covers 2½" or 3" Dowel. Special sizes and lengths available.

HOOK BOLT ASSEMBLY

For providing required tieing element along longitudinal joint. Eliminates necessity of banding tie bars or drilling road forms.

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From this man-made lake in northeastern Quebec . . .

Power comes to Montreal

Hydro-Quebec Brings in Bersimis Power . . .

Power generated at Bersimis I powerhouse was brought to Montreal last month.

From three 150,000-hp units in an underground powerhouse 400 mi away, the Quebec Hydro-Electric Commission is now delivering power to its headquarters city. And another five such units will be completed over the next 18 months at the remote, $225 million Bersimis development. (ENR Nov. 17, 1955, p. 34).

Bersimis I, brought in right on schedule, was chosen by Hydro-Quebec as its next big project only a few years ago. Surveys began in 1952 and were finished in December, 1953. It took just three years from then to bring electricity over the exceptionally long transmission haul to Montreal.

Construction of the project involved two rockfill dams, 200 and 230 ft high; a 31-ft dia tunnel, 7½ miles long; and the underground cavern that will house an ultimate 1.2 million hp.

Not the least of its outstanding features is the 450-mi of 300,000-v transmission line that connects Bersimis to Montreal. This accounted for some $75 million of the project's total cost.

. . . And Still Keeps 'em Guessing on Its Next Big Move

As Quebec's Hydro Electric Commission delivered its first power to Montreal from the remote Bersimis project, the question remained as to when and where the agency would start work on Lachine Rapids on the St. Lawrence River above Montreal.

There was even question as to whether the Lachine project might again be deferred in favor of still further power development in the bush north of the St. Lawrence River in Eastern Quebec. Specifically, there is the Manicouagan River beyond the Bersimis, practically untouched and tempting development.

In addition, Hydro Quebec admits to having a $495-million capital expenditure program for the next six years on projects including neither Lachine nor the Manicouagan River.

In spite of recent newspaper reports, which Hydro Quebec labelled as untimely and inaccurate, the power agency is just not saying exactly what is planned for the Lachine Rapids, nor when it plans to make its move there.

It has been generally accepted that the power plant to be built there will have a capacity of about 600,000 kw, and a cost figure of $175 million has been discussed. The project might might take three years to build. It has been discussed variously as a single-dam project and as a two-stage development with a dam at the foot of Lachine Rapids and a dam below Montreal's Victoria Bridge.

• **Ice affects project**—There is an interesting technical feature in development of power in this stretch of the St. Lawrence. It concerns the troublesome formation of ice in the river. If the flow of the river can be slowed down sufficiently by whatever is built, sheet ice will form and the frazil ice, so troublesome to turbines, can be avoided. (Fazil ice piles up against a powerhouse cutting down the head and therefore the power in winter.)

If a dam is built at Lachine Rapids, it has been said that the channel will have to be enlarged considerably to reduce flow and permit an ice cover to form on the river above the powerhouse. A flow of 240,000 cfs could be handled, but actual flow is more apt to be 280,000 cfs during the winter. An arrangement has been made to pass the excess 40,000 cfs through the Seaway canal now being built. The canal would not be usable in winter anyway.

Equipped with 8-ft. dozer-blade, D Tournapull not only loads, hauls, spreads, but can also doze truck-dumped fill — doing double-duty. Blade is raised for scraper work.

Naval Air Station
one of 42 jobs in 27 months
for 3 "Handyman D's"

Ask Bob Forrester, owner of Reca Construction Company, Gardnerville, Nev., about the speed and versatility of his 3 D Tournapulls, and he will show you their outstanding work record—42 jobs in 27 months! Jobs varied widely in size and type. But on all of them, versatile "D's" handled dirtmoving assignments fast, efficiently, and at low cost for Forrester.

Grade for Naval Air Station

On the project shown here, Reca Construction's "D's" cleared and leveled the site for expansion of the Naval Air Station at Fallon, Nev. More than $3.5 million was spent by the U. S. Navy to improve old facilities and construct new ones at Fallon. Included were buildings, utilities, and additional aircraft parking space, amounting to 50,000 sq. yds.

Before any construction could begin, 127,000 cu. yds. of sand had to be moved to level the site. Reca sub-contracted to do the basic clearing work in 90 days.

3 "D's" average 9 trips hourly on 4.4-mi. cycle

Bob Forrester of Reca brought in 3 D Tournapulls, 3 Super "C's", four crawler-tractors and a grader for the job. Half the work-time was spent hauling borrow. Length of average one-way borrow-to-fill hauls was 3000'. Scrapers also removed unsuitable material from the site, and hauled in select sand to fill.

On one long haul, over a 4.4-mi. cycle, each D 'Pull averaged 3 loads per hr. Here Tournapull's rubber-tired speed paid real dividends in lower costs and time savings.

LeTourneau-Westinghouse machines handled 101,600 yds. — 80 per cent of the total sand moved. With dirtmoving production like this, Forrester's contract time-limit of 3 months was easily met.

Cut costs 30% on housing project

On another project—leveling land and grading streets in a housing project at Mountain Home, Idaho—Reca's D Tournapulls out-performed four competitive machines of larger capacity. Highly-maneuverable "D's" cut costs 30 per cent. Tight dumping and spreading areas —plus strict compaction requirements — made D Tournapull the only logical, economical tool.

Forrester has also used his "D's" as gravel-spreaders on highway projects. Operators spread a thin, smooth coating of gravel as they drove loaded rigs down road-sections at high speed.

Versatile "D's" handle many jobs

In land-leveling, the "D's" pulled heavy, land-planes. In land-clearing, they uprooted trees. Here chain was linked from scraper to lower trunk. 138 hp "D" then pulled complete tree from the ground, roots and all. Rigs also picked up sagebrush, which had been windrowed, and hauled it away for burning.

Forrester is very pleased with his Tournapulls' versatility and performance. "Ease of operation is good with the 'D's'," he says. "It's a versatile machine for many different operations."

More information available

Improved D Tournapull now available, can cut costs and speed work on *your* contracts. "D" has 9-yds. heaped capacity, 8' width, and permissable axle-load . . . requires no special road permit. Call or write us for information.

One of Forrester's "D's" hauls at high speed at Fallon on clean-up phase of job. Tournapull "Handyman" does an efficient job of smooth-finishing, as well as moving big-yardages.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-930-8-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

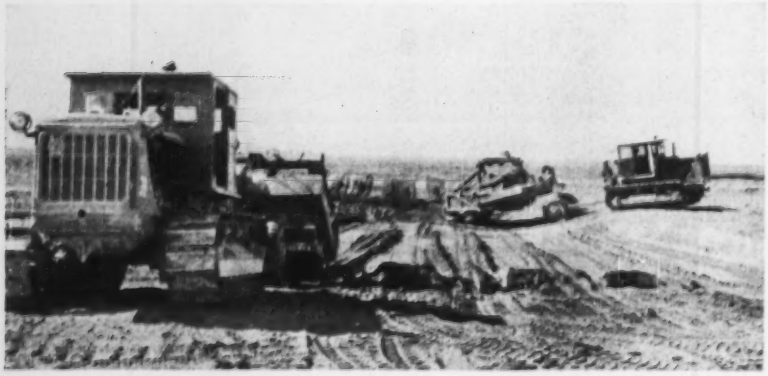
WHERE QUALITY IS A HABIT

• **Manicouagan calls**—A bill passed at the last session of the Quebec Legislature gave Hydro Quebec right to tap all the potential of the Manicouagan River beyond an amount sufficient to support the first stage of a new aluminum development of Canadian British Aluminum Company at Baie Comeau, Quebec, 200 miles east of Quebec City. This plant will require some 250,000 hp, to be supplied by Manicouagan Power Co. through expansion of an existing 90,000-hp plant on the river. Eventually this aluminum plant will require another 150,000 hp, to be supplied by Hydro Quebec.

All told, the power potential of the Manicouagan is estimated at 3 million hp; and there is even more power on the nearby Outardes River. The entire area is under steady and careful study for Hydro Quebec.

The horsepower from Bersimis that entered Montreal last month was part of an eventual 2 million hp to be developed at Bersimis. Bersimis No. 1 is scheduled to be completed by Oct., 1958, with 1.2 million hp; No. 2 is not due to be done until 1961. Most of this power is already committed, so there is some urgency for a choice of which big job Hydro Quebec will tackle next.

Bersimis is nearly 400 mi from Montreal, and the Manicouagan is even farther east. It's a long transmission haul, but Hydro Quebec may decide that it is worth it. Or it may soon announce that one Lachine project or the other is its choice.



Russians Bring Water to a Desert

Soviet heavy construction machinery is pictured at work on a 550-mi canal in the Kara Kum Desert in the extreme southern part of central Russia between the Caspian Sea and the Himalaya Mountains. Water from the Amu Darya River, which flows northward into Lake Aral, will be diverted westward into the Murgab oasis, a landbound stream.

The Russians are reported to have progressed about 125 mi and 60 mi from each end of the first 250-mi phase of the project. Over the entire canal length, some 65 million cu yd of sand are to be excavated and about 65,000 cu yd of concrete are to be placed.

While the primary purpose of the Kara Kum Canal is irrigation, there are to be some hydroelectric facilities.

Argentina's Second City Plans Nation's 2nd Subway

Argentina's second city, Rosario (464,688 inhabitants), plans to build its own subway, which will be the second subway system in the country.

Estimated cost of construction, according to the engineer Pedro J. Cristiá, former president of the Provincial Economic Federation, and author of the plan for the subway, will be about $14 million.

The line will run roughly north and south, following the line of the Paraná River, which the city borders, with a spur to the west.

Data for the project include:

North line: 8,900 meters. 12 stations. Duration of the run, 15 minutes. Service every three minutes, with 10 trains of two motor coaches each.

South line: (meeting north line at Plaza Sarmiento) 6,200 meters. 10 stations. Duration of the run, 11 minutes. Service every three minutes with 8 trains of two motor coaches each.

West line: (a spur meeting the north line at "Estacion de Collectivos") 4,500 meters. 7 stations. Duration of the run, 10 minutes. Service every three minutes with 4 trains of two coaches each. Maximum grade: 1%.

Length of Platforms: 90 meters.

All the materials for construction will be domestic, it is pointed out, with the exception of rail, cable, 50 individual motor coaches, signalling and safety equipment, transformer sub-stations.

The first portion to be built will consist of the central halves of the north and south line, which are the most urgently needed sections. These are expected to be completed within two years of the commencement of work. The further extensions to the north, south and west, it is stated, can be completed in two more years.

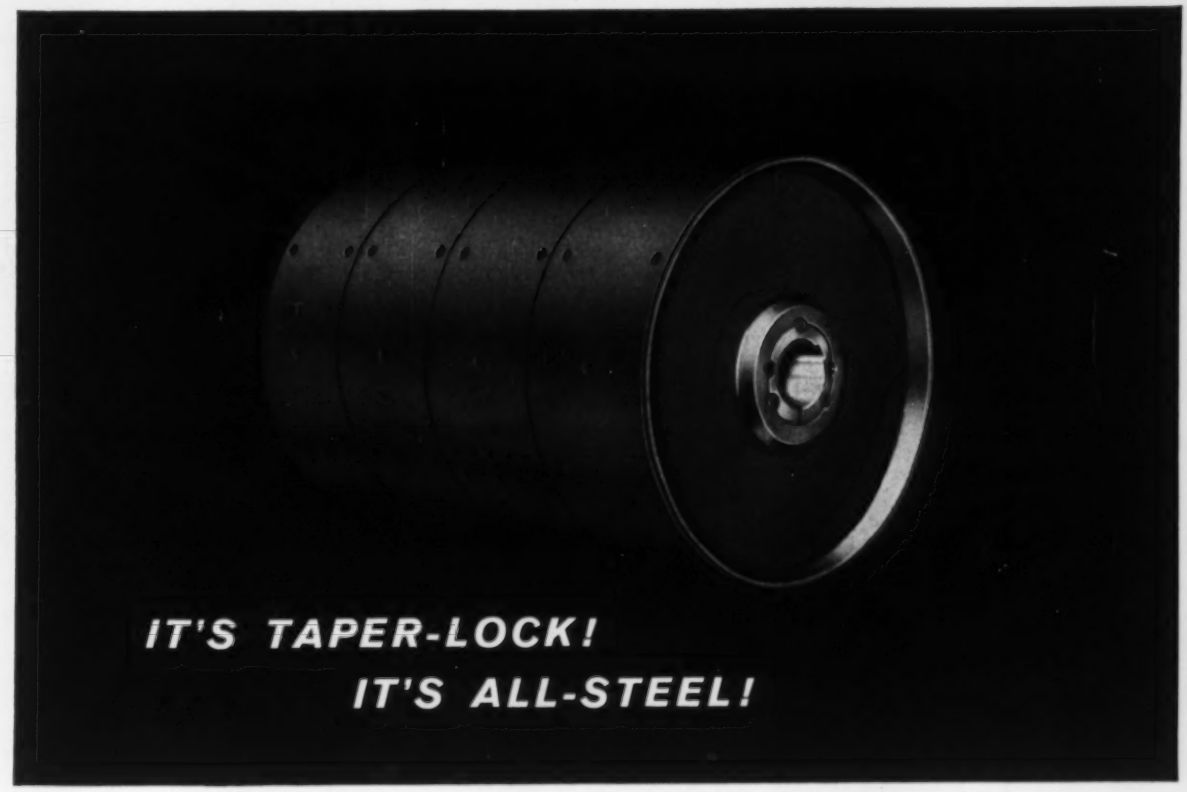
Construction is to start in 1957.

Irrigation Plan for Sardinia To Follow World Bank Loan

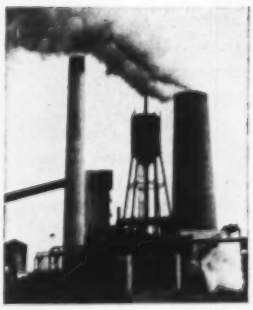
Large-scale irrigation works for the southwestern part of Sardinia will be partly financed by $25 million of a $75-million loan for public works recently made by the International Bank for Reconstruction and Development.

Cassa del Mezzogiorno (Fund for the South), which received the loan, estimates that the project will cost $85 million, and that irrigation of 123,000 acres will begin in the spring of 1958.

Dams across the Flumendosa, Flumineddu and Mulargia Rivers will form reservoirs with a total capacity of 500,000 acre-ft.



The modern Conveyor Pulley for superior performance . . .



One tough application after another proves beyond doubt that you can't beat a lagged, Taper-Lock Steel Conveyor Pulley for the hard jobs! Here is the score on their use in rugged coke plant service. In this particular case the installation was on belts from the quencher and loading belts to cars. The report was made after *three years of use.*

1. **One-third saving on initial cost.**
2. **Saving on maintenance; no redressing of pulley faces.**
3. **No appreciable wear on lagging.**

In addition, these Taper-Lock Steel Conveyor Pulleys provide the further benefits which are inherent in their design:

1. **No bolts to shear.**
2. **Easy on — easy off.**

Taper-Lock Steel Conveyor Pulleys have terrific impact capability. All welds are made by the submerged arc process for 100% strength. Taper-Lock's patented back-up bar permits a weld of the full rim thickness to give 100% penetration. And there are no bolts to give way!

Normally available from stock in all face widths and diameters from 6 inches to 8 feet. *Write for bulletin.*

DODGE MANUFACTURING CORPORATION, 6900 Union St., Mishawaka, Ind.

CALL THE TRANSMISSIONEER your local Dodge Distributor. Factory trained by Dodge he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Equipment" or write us.

DODGE
of Mishawaka, Ind.

Rain, Slides Fail to Halt Guatemala Road

Landslides, rockfalls from hundreds of feet overhead and a five-month rainy season were all part of the job for U. S. contractors who have just completed a 9.4-mi section of the Inter-American Highway in Guatemala.

The location is an area known to Central Americans as "El Tapon" (The Plug) since it is one of the last barriers on the road from the United States through to Costa Rica.

The original contract, for $1.2 million, called for 1.3 million cu yd of unclassified roadway excavation on what amounted to a sidehill rock excavation project running through the rugged mountains of the area.

There were certain advantages for the Fisher Contracting Co. of Phoenix, Ariz., and Compania Contratista Fisher de Guatemala, which took the job: More than 90% of the material could be wasted into the canyons below so that little haulage was necessary. But in February of 1956 an addition was made to the original contract to bring total excavation and slide removal to about 2.3 million cu yd.

The job went into high gear in July, 1955, with the arrival of seven crawler tractors, two rippers and a shovel, later to be supplemented by four more heavy tractors and three carrying scrapers.

Biggest problem was landslides, a daily occurrence, smothering and sometimes eliminating the roads carved out of the steep hillsides. Several tractors were damaged heavily by the landslides and one compressor was never seen again after being knocked into a canyon by falling rock. At times, camps and supply bases were isolated and fuels and greases had to be transported by native carriers in 15-gal cans.

Among other problems for John F. Fisher, head of the joint venture, was the fact that two of the U. S. personnel at the beginning spoke Spanish and most of the Guatemala natives spoke with an Indian dialect. But an intensive safety and training program had good results, the contractor reported.

First Limited Access Road British Begin Building

The Preston By-Pass in Lancashire, England, which will be Britain's first true limited access highway, has aroused more interest than any other of all the new roads being built in the country.

Work recently started on the bridges, which will carry existing traffic routes over or under the highway.

Several different forms of construction are being used: Twelve of the bridges will be built with precast prestressed concrete beams; six will be of ordinary reinforced concrete; and five will have steel main beams with reinforced concrete decks and abutments. Substantial sums will be saved by using factory-precast concrete beams.

The line of the by-pass, which is to cost $8.4 million, starts just south of Bamber Bridge, near the junction of the A6 and A49 roads, and swings to the east of Preston to join the Preston-Lancaster trunk road A6 just south of the village of Broughton. It will have two 24 ft. roadways over the whole of its length, and a median 32 ft. wide, which may be reduced to 12 ft. to give each roadway three lanes instead of two if traffic warrants. The new by-pass is exclusively for the use of motor vehicles; pedestrians, pedal cyclists, and all other traffic will be excluded. Access to it will be at four points only, as compared with 1,900 points on the existing road.

The road will be the fastest in Britain, driving time from one end to the other ranging from eight to twelve minutes compared with up to one and a half hours for the old route at times when traffic is thickest.

Nickel Center

Inco's Manitoba project includes power plant to be built by government

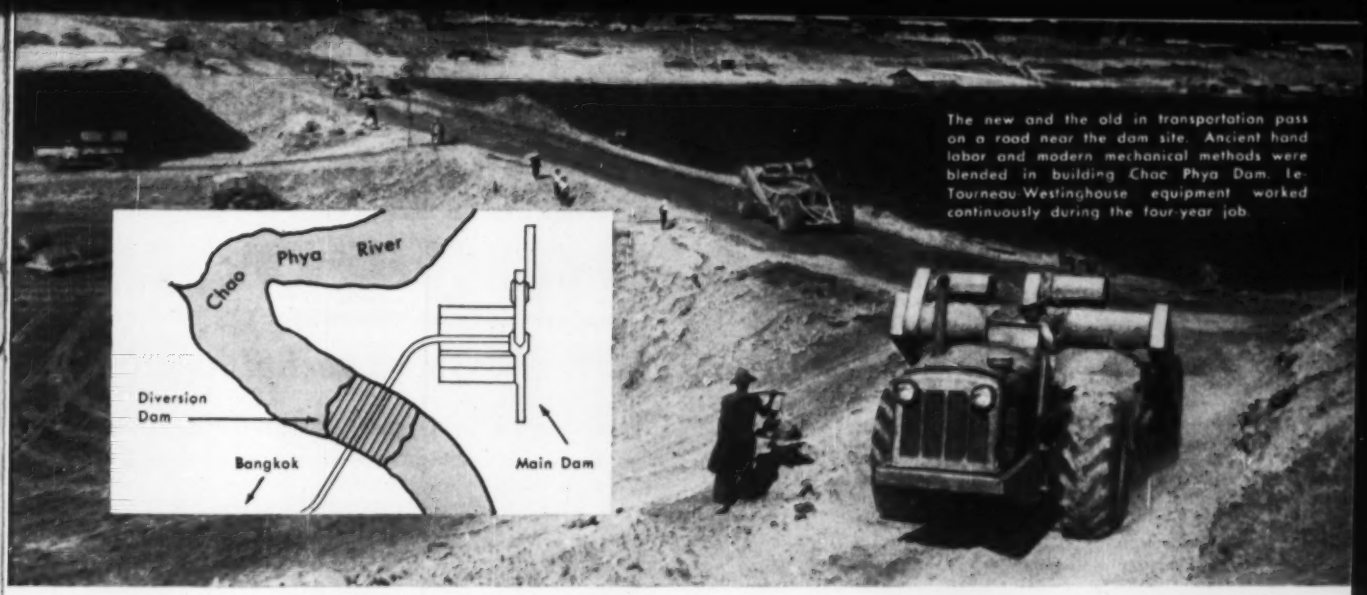
International Nickel Co. of Canada, Ltd. (Inco), is taking advantage of newly frozen muskeg to move equipment and supplies to its Moak Lake-Mystery Lake project in Manitoba.

The $176-million mining complex, when completed in 1961, will be the world's second largest nickel-producing center (largest is at Sudbury, Ont.). The venture includes development of mining claims said to cover over 400 sq mi, building of a townsite, rail extensions and a $32- to $38-million hydroelectric plant.

The power plant will be built by the Manitoba government, which will have to do some heavy borrowing to finance construction. Inco will assist by providing a four-year $20-million loan. The plant will initially produce 102,000 kw—to fill Inco's needs—and is expected eventually to have seven or eight generating units.

Engineers of the Canadian National Railways now are locating a route. For a spur line to link the mining center—30 miles from the nearest railroad to the outside world. When this is completed INCO expects to begin groundbreaking for a road and 20-mi rail spur joining its Moak and Thompson mine sites.

In addition to beginning work on a town to house 8,000, construction in the early half of 1957 will concentrate on the railroad, a mineral concentrating plant and smelter, and the hydroelectric station.



The new and the old in transportation pass on a road near the dam site. Ancient hand labor and modern mechanical methods were blended in building Chao Phya Dam. LeTourneau-Westinghouse equipment worked continuously during the four-year job.

Helping to heap the "rice bowl" of Asia

Plans for the ambitious Chao Phya Dam project had been laid during the reigns of Rama V and Rama VI (1900-1925). But not until Buddhist year 2493 (1950) were the means available. In that year, construction was started at a site about 170 miles northeast of Bangkok. Total project cost is $58,000,000 of which $40,000,000 is the budget appropriation, and $18,000,000 is the loan from the World Bank.

15 LeTourneau-Westinghouse units used

Ten C Tournapulls and 5 Tournatractors were included in the work fleet used. They were driven to the site in 2 convoys. The rubber-tired machines covered the 174 miles from Bangkok to the river's edge near Chainat in 2 days. The earthmovers were then ferried across the river on barges.

In the first 4 years of construction, 3 million cubic yards of cemented clay hardpan were moved, most of it by the Tournapulls. Most of the time these 208 hp rubber-tired scrapers had to haul their loads up 10 to 15% grades. Crawler tractors push-loaded scrapers, bulldozed fill, maintained haul roads. Tournatractors accomplished clean-up around draglines, and kept haul roads open.

Irrigates entire central plain

Since completion, the new dam has revolutionized agriculture in the central plain (which drops only 3.28 ft. in height for every 32,800 ft. of surface distance). The project provides continuous irrigation water for 1.4 million acres of rice-land which once depended on rainfall alone. It also supplements the irrigation water supply of 923,000 acres already irrigated by the inundation method.

Meet schedules, cut costs, make profit

Your earthmoving jobs may not run into millions of cubic yards like this one. But on any earthmoving project, fast, rubber-tired LeTourneau-Westinghouse equipment will help you to meet schedules, reduce costs. Ask us for more facts on Tournapulls and Tournatractors, as reported by equipment owners all over the world.

One of the 10 C Tournapulls working at Chao Phya Dam returns to the navigation cut area to reload. A total of 3,000,000 cubic yards was handled during construction.

Thai operator spreads cemented clay hardpan fast and accurately. Simple Tournapull controls, plus ready adapability of Thais to modern earthmoving methods, speeded job.

Tournapull, Tournatractor—Trademark Reg. U.S. Pat. Off. CPCT-1063-D-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

Copyflex Machines and Sensitized Materials

ADD MANPOWER TO YOUR DRAFTING ROOM

Modern Reproduction Machines, Materials, and Techniques Cut

The boom in production means more pressure than ever for engineering prints and drawings. Now, more than ever, is the time to (1) replace that old, inadequate reproduction unit with a modern, efficient Copyflex machine and (2) capitalize on the many drafting shortcuts made possible by Copyflex reproduction machines and sensitized materials.

Six New, Advanced Machines: In just the past 18 months Bruning has introduced six new, greatly improved models—five of which are shown at right. They bring you not only faster reproduction but a host of design improvements that will boost your drafting room output sharply. One of these six new machines will surely meet your exact requirements.

Slash Re-Drafting Time: Your Copyflex machine is more than a means of making conventional opaque prints of finished drawings—it can also help you in your actual drafting operations. In many cases involving the re-working of existing drawings, for instance, it can save you up to 90% in tracing time through the use of translucent prints ("intermediates") made on film, cloth, or low-cost paper. Consider how much of your drafting is devoted to design changes, changes in standards, and similar alterations and you'll see why adding Copyflex to your production team will *add manpower to your drafting room.*

This design change took hours to make because it was done entirely at the drawing board.

The same design change was completed in less than an hour with the aid of a Copyflex intermediate.

These Materials Speed Reproduction *and* Drafting

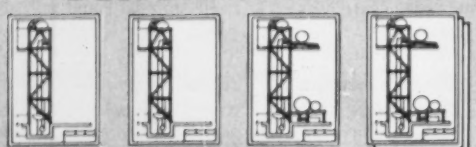
Copyflex Translucent Sensitized Paper: Prints made on this 100% rag, resin-transparentized medium provide: (1) a positive, reproducible image of all or any selected part of an original; (2) a workable drawing surface for making additions or alterations; and (3) excellent translucency for making fast, sharp reproductions. In the making of design changes, prints made on this paper eliminate the need for tracing those sections of the design which do not require alteration. Unwanted portions can either be masked out in the printing operation or eradicated on the translucent print . . . then new lines added. The paper prints accept pencil and ink, and drawn lines are erasable. Subsequent alterations are achieved just as easily and quickly by use of the same reproduction-drafting technique.

Copyflex Sensitized Matte Film: Usable for same purposes as Copyflex Translucent Sensitized Paper, but is highly transparent and much more durable. Reproduces faster than originals made on tracing paper.

Copyflex Sensitized Clear Film: Offers complete transparency and extremely fast reproduction speed. Not suitable for drawing, but ideal for making composite prints, overlays, and projection prints. Various developers can be applied to it to produce different color effects.

Copyflex Sensitized Tracing Cloth: A top quality moisture repellent cloth with excellent pencil and ink workability. The ideal material to use when circumstances require a translucent print with exceptional durability and strength.

HOW COPYFLEX SPEEDS DESIGN CHANGES



Original Drawing | Translucent Print of Original | Print with Alterations Drawn In | Prints Made from Altered Intermediate

Problem: To make a design change without marking or altering the original drawing or tracing.

Old Method: (1) Trace unchanged parts of the original by hand; (2) draw in the design changes or alterations.

Copyflex Method: (1) Reproduce unchanged parts of the original in a matter of seconds on Copyflex translucent paper, cloth, or film—blocking out or later eradicating any unwanted portions of the original design; (2) draw in the design changes or alterations.

Result: Substantial savings in time, money, and drafting room manpower.

NEW!

Desktop Model 300: Perfect for small firms, an ideal "extra" machine for large firms. Makes prints up to 30" wide by any length. Operates on 110 volt A.C.

Drafting Time, Boost Productivity!

NEW!

Model 500: A heavy-volume machine offering top mechanical speed of 40 f.p.m., 46" printing width, automatic separation and stacking, front or rear delivery, and many other advanced features.

Model 250: Takes less than a sq. yd. of floor space. Has top mechanical speed of 25 f.p.m., 18½" printing width, automatic separation and stacking. Operates on 220 volt A.C.

Model 200: A 110 volt A.C. version of the Model 250.

NEW!

NEW!

Model 35: Provides up to 30 f.p.m. mechanical speed and a full 46" print-width for heavy volume reproduction at a thrifty, low cost.

Model 20: Not a new model, but a dependable performer well worth your consideration. Makes prints up to 46" wide. Operates on 110 volt A.C.

Model 30: A faster, 220-volt version of the Model 20.

Desktop Model 110: A new and improved small machine with 11" printing width. Makes 8½" x 11" prints for less than 1¢ each for materials. The helper your big machine needs!

NEW!

SEND FOR MORE INFORMATION TODAY!

BRUNING Copyflex

Best Process! Best Machines! Best Selection of Materials!

Offices in 37 Cities of the U.S. and Canada

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4700 Montrose Ave., Chicago 41, Illinois

Please send me information on the Copyflex process and the following machine(s): _____
and sensitized materials: _____

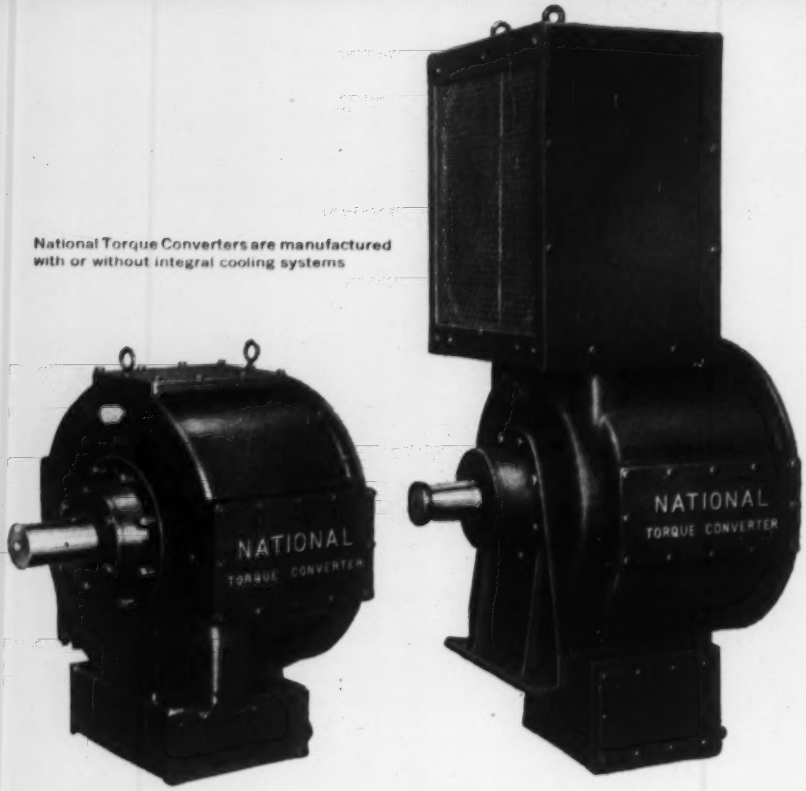
Name _____ Title _____

Company _____

Address _____

City _____ County _____ State _____

National Torque Converters are manufactured with or without integral cooling systems



Plan now to DESIGN with National Torque Converters

The simplicity of design of National Single-Stage Torque Converters permits exact matching of torque converter to prime movers of 100 to 1000 horsepower. Installation is simple and easy on stationary as well as mobile equipment. When matched to your prime mover, the National Torque Converter assures uniform top performance on every job. It will give your equipment a constant flow of smooth, steady power over a wide range of loads. It permits quicker starting and faster acceleration of loads, with no lugging or stalling of the prime mover. The torque converter absorbs the shock of sudden overloads, permitting the prime mover to operate at all times at governed or optimum speed.

Our engineers will gladly discuss the application of National Torque Converters to your equipment and help you select exact size and torque capacity. Why not call on them? Or write for Bulletin No. 468.

THE NATIONAL SUPPLY COMPANY

INDUSTRIAL PRODUCTS DIVISION

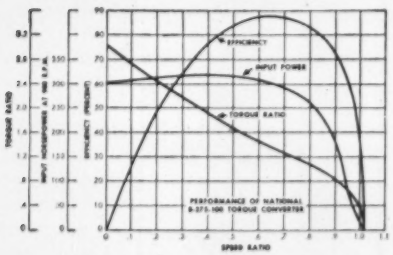
Two Gateway Center, Pittsburgh 22, Pa.

Pace-setters in the progress of industrial power transmission

Consider these National Torque Converter features

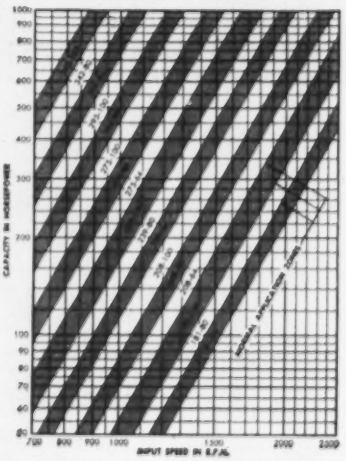
- SIMPLICITY OF DESIGN for ease of installation, operation and maintenance
- FULL RANGE OF CIRCUIT SIZES permits exact matching to prime movers of 100 to 1000 horsepower
- TOP PERFORMANCE enables engine or motor to operate at its optimum speed . . . deliver maximum horsepower constantly
- REPRODUCIBLE EFFICIENCY assures uniform top performance on every job
- FASTER JOB CYCLES means more loads per equipment per operator per day
- UNSURPASSED DURABILITY provides longer service life with minimum maintenance

Typical performance curves



Curve shows torque-speed ratio for series B-275-100 National Torque Converter. Performance Curves of all six sizes and 17 hydraulic circuits covering the 100 to 1000 horsepower range are available on request.

National Torque Converter Capacity Chart



Electric Heating Cuts Asphalt Plant Costs

For years, asphalt plants have required messy, uneconomical and hard to control steam boilers to keep the product flowing

Now, automatically controlled electrical heating elements cut operational costs, simplify maintenance and increase efficiency

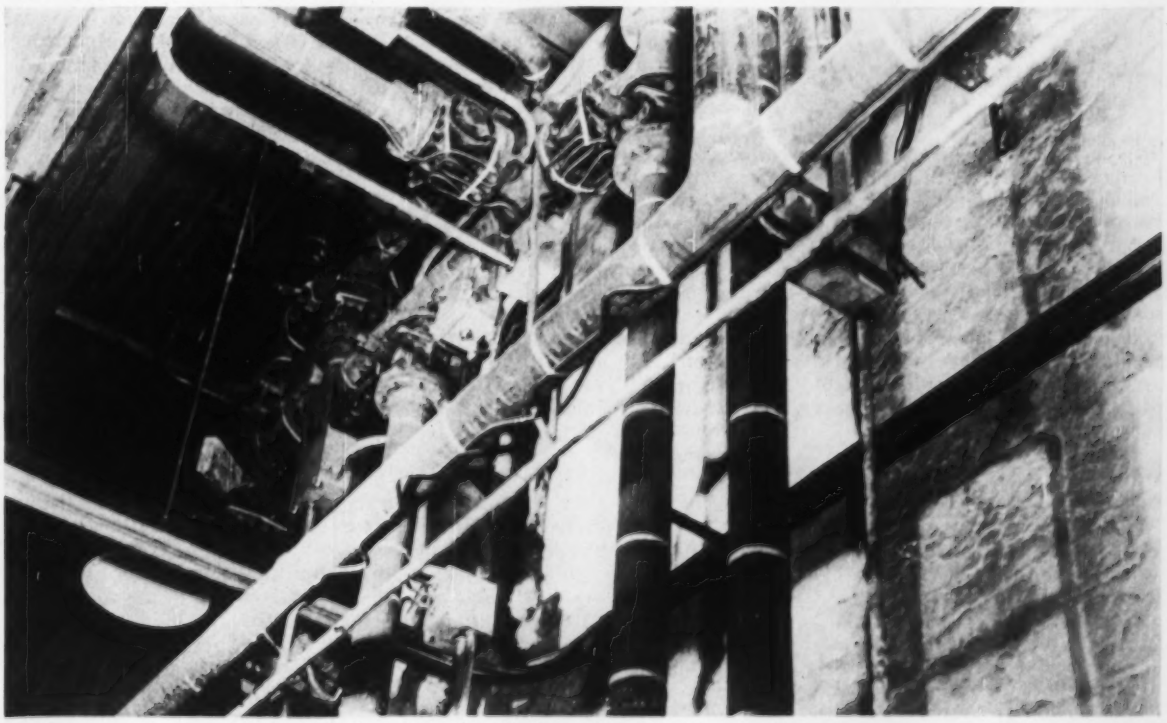
By Wayne J. Smith
Industrial Heating Dept.
General Electric Co.

The principle of application of electric heat for industrial uses has recently been applied to asphalt plants, where controlled heating of pipes, valves, pumps and tanks is necessary to keep material fluid until it is ready to be combined with aggregate.

High-pressure steam is commonly used—but steam pressure must be maintained at all times, and narrow temperature limits are difficult to maintain. Also, excepting where the smallest type boilers are used, a stationary engineer—and in some localities, a fireman—is required by law.

When heating electrically, power is used only when heat is required and, under automatic thermostatic controls, narrow limits of temperature can be maintained with maximum efficiency

Immersed heaters for large tanks consist of two parallel elements within a capped four in. pipe. Standard pipe cap at outside end permits quick inspection and cleaning.



Tubular heaters shown strapped to pipes and valves. Kinking and waving of elements is sometimes necessary to obtain sufficient heating area. All heated units must be well insulated, but to prevent blanketing of elements, heater and pipe or valve must first be sheathed with metallic covering.

. . . Electric heating cuts asphalt plant costs

even in a wide temperature range. Leaky steam lines and valves are eliminated and a major source of dirt and soot removed.

Use of electric heat in this application requires an engineering know-how peculiar to the asphalt industry. Each piece of equipment in an asphalt plant requires a special heater with special fittings.

• **Large asphalt tanks**—These vessels are often heated by special electric heaters, consisting of two straight elements lying side by side about ¾ in. apart and connected in series by brazing the two inner ends. These heaters are inserted into 4-in. wrought iron tubes, similar to boiler tubes, but capped at the inside end which projects through the tank wall into the asphalt near the tank bottom. A centering guide in the end cap and centering discs welded to the element at intervals along its length prevent "hot spot" carbonization of the asphalt. At the junction box end, a standard pipe cap is welded around the element. Thus a single complete element is fabricated so it will slide easily into the tube as a unit and be firmly attached simply by screwing up the pipe cap. This also facilitates removal of units for servicing and inspection. By proper selection of heating elements (a 3.5 kw rating is advised) general carbonization of the asphalt can be avoided.

• **Draw and fill tanks**—In tanks which are emptied each day and heated prior to refillings, even pipe-encased heating units immersed in the asphalt may cause gradual accumulation of carbonized material. These slag-like pieces could enter the pipe line and jam various apparatus unless periodically removed from tanks. For this reason, an external heat installation is preferable where possible. The condition does not occur in main tanks in which tubes are always covered by asphalt.

• **Mixers**—Mixers are heated by units, clamped to the side walls and bottom, in which the elements are covered with a metal shield and heat insulation. Proper care must be taken to avoid blanketing of the elements, since this blocks heat dissipation and causes the element to overheat and burn out. This point cannot be over emphasized.

Asphalt flowmeters, pumps and weighing equipment may be available only with the usual surrounding jackets intended for steam heating. Electric heat still can be used by providing a small circulating hot oil unit located close to the equipment. Oil, heated by oil immersion heaters, is circulated through the jackets. The entire system, including the jackets, should be completely insulated.

• **Pipelines**—Pipeline heating in an asphalt plant differs from main tank heating in that the heaters are applied to the outside of the pipes and are used principally to overcome losses. A small additional capacity, however, is necessary to "unfreeze" lines prior to start-up. Three to four hours of line preheating assures complete liquefication of material left from previous pumping operations.

As soon as asphalt begins to flow through a pipeline, external heating may be discontinued, since loss of heat in insulated and preheated pipelines is light during continuous flow. Strategically located thermostats automatically discontinue heating as soon as asphalt has flowed through the lines for a few moments.

• **Heating tubes used**—Tubular heating units are applied by wrapping them around the pipe or by laying them along the length of the pipe and strapping them in place. In either case, the heaters may be twined around valves and other fittings to provide adequate heat. The assembly is then covered with sheet metal which is in turn covered by insulation—which should be coated with a waterproofing compound. When heaters and pipe spacers of the same diameter are installed, they may be placed diametrically opposite each other on the pipeline, thus permitting use of round sheet-metal forms and an increase in the effectiveness of the heaters.

After calculating the required effective heater length, it is best to add an additional 4 in. for each 15 ft of heater. The additional length compensates for installation deviations from piping layout drawings as well as contraction or expansion that might occur. Should the element be longer than the unit to be heated, an occasional kink or a series of bends may be introduced to take up the excess length. With kinking, spacers will be needed on the opposite side of the pipe so that the sheet-metal coverings will fit properly.

At terminal ends, the heating units are bent at right angles to the pipe so that the terminals project through the insulation. This requires a cold terminal length of approximately 18 in. at each end of the heater. Moisture-tight seals, with bushings and nuts, permit mounting to a water-tight terminal box.

Depending upon the type and amount of insulation used, a connected load along the pipe of 100 to 130 watts per lineal foot can be expected. All circuits should have control lights in series to show that heaters are operating.

Heating should occur when plant machinery is not operating. Peak demand will thus be kept at that required for machinery alone, with a low-cost transfer of asphalt from storage to service tank after the shutdown of all but enough machinery to cover pumping demand. After transfer is completed and additional machinery is shut down, service tank heating is started.

The three-to-four-hour preheating period insures that for the next production cycle, pipe lines, pumps, tanks, meters and mixers will be ready for operation when needed, even though all heating is done at the off-peak-load periods.

• **Power source**—Power for heating comes from a control room where the system is divided into two sections. One section distributes power to several local push-button control panels for heating all pipelines, pumps, surge tanks, meters, strainers, spray bars and mixers. The other furnishes power for heating storage tanks. Each storage tank has its own control panel containing the necessary devices for manual, semi-automatic and automatic operation, plus temperature recorders, heater operation indicators, time switches and protective devices.

• **Calculation of heat required** for efficient pipe line heating, losses at operating temperature and heat required to raise the system from ambient to operating temperature must be considered separately. The required amount of insulation is determined from insulation tables based on actual operating temperatures. Since losses are a function of the temperature difference between operating and ambient temperatures and of the thickness and type of insulation used, attention to over-all insulation is a must when calculating losses, use lowest ambient expected.

• **Control** is obtained by placing a thermostat bulb directly against the pipe with power for the heaters connected directly through the thermostat contacts or, for higher ratings, through a magnetic contactor controlled by the thermostat. The watts density of the heaters should not exceed 30 watts per sq. in., since values greater than this are apt to cause carbonization.

Want more POWER

for faster scraper loading?

At work on a roadbuilding job in Kansas, Twin-C tractor push-loads 8 Tournapull with heaped load of sticky gumbo in ½ minute in short loading distance. With powerful 416 hp "Twin-C" behind it, 'Pull's scraper blade easily digs in, carves out tough material.

The best answer to today's need for more effective push-power behind your scrapers is the new 4-wheel drive, twin-engine Twin-C tractor. Highly maneuverable, this giant 416 hp rubber-tired tractor positions fast. One-man with "Twin-C" piles heaping loads in your biggest production scrapers in a hurry . . . often eliminates need for tandem pushers.

Prime factors in rig's exceptional pushing production are its 416 horses, driving 40 tons of machine through 4-wheel drive traction and tires 2½′ wide and over 7′ high.

Twin engines, drive trains, boost push-power

Two independent drive trains, powered by two synchronized 208 hp GM Diesel engines, each have low-pressure, trouble-free torque converters to provide an infinite ratio of speed ranges. These converters automatically transform engine power into most efficient ratio of pulling power and speed to fit your changing demands in the cut. As a result, "Twin-C" delivers maximum drawbar pull, maintains strong, constant contact between pusher and scraper — regardless of scraper loading-speed, material, or underfoot conditions. Recent Dynamometer tests, made in sandy clay footing, with optimum moisture content, showed "Twin-C" registers an *actual* 65,900-lb. drawbar pull in 1st gear!

Power-transfer differentials add tractive power

For best ground-gripping traction in sand, mud, or other loose materials, big-tired "Twin-C" is equipped with 2 exclusive power-transfer differentials — one for each pair of drive-wheels. These differentials automatically transfer power from slipping wheel to wheel on firmest footing . . . keep pusher driving ahead when going is tough.

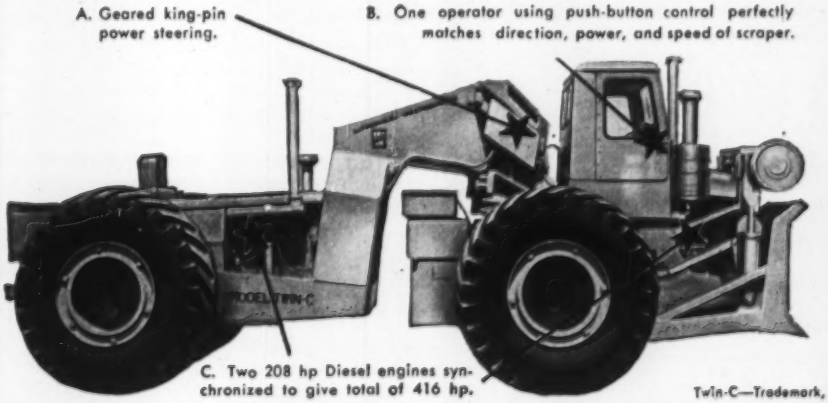
"Twin-C" . . . easy to control

Simple fingertip electric controls on "Twin-C" respond instantly in any weather. They provide positive power-steer . . . power-positioning of sturdy, concave push-plate. Operator smoothly applies massive pushing power as he spots big (49½″ x 88″) floating push-plate behind scraper push-block . . . always gives you fast, profitable scraper-loading.

Fast positioning speeds work cycle

Rubber-tired speeds, geared king-pin power-steering, and synchronized constant-mesh transmissions make the "Twin-C" very maneuverable in the cut. Fast forward speeds, to 20 mph, plus easy maneuverability, let tractor operator position fast behind scraper. With power-steer and high reverse speeds, rig loses no time backing up and getting into position for push-loading the next scraper.

Constant-mesh transmissions give any gear ratio instantly. With gears always in mesh, you eliminate delays in changing gears . . . save vital momentum, reduce costly "lug downs" and gear changes that slow down other pushers. "Twin-C's" power, speed and mobility prevent loading delays.


A. Geared king-pin power steering.
B. One operator using push-button control perfectly matches direction, power, and speed of scraper.
C. Two 208 hp Diesel engines synchronized to give total of 416 hp.

King-sized pushing power for your fleet

If your fleet includes production scrapers of any kind, you will want more information on the powerful, big-capacity LeTourneau-Westinghouse Twin-C tractor. This revolutionary new pusher will increase the length of your work season . . . keep your dirtmoving cycles rolling for better profits. Call or write for more complete details.

Twin-C—Trademark, Tournapull—Trademark Reg. U.S. Pat. Off. TW-1095-G-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

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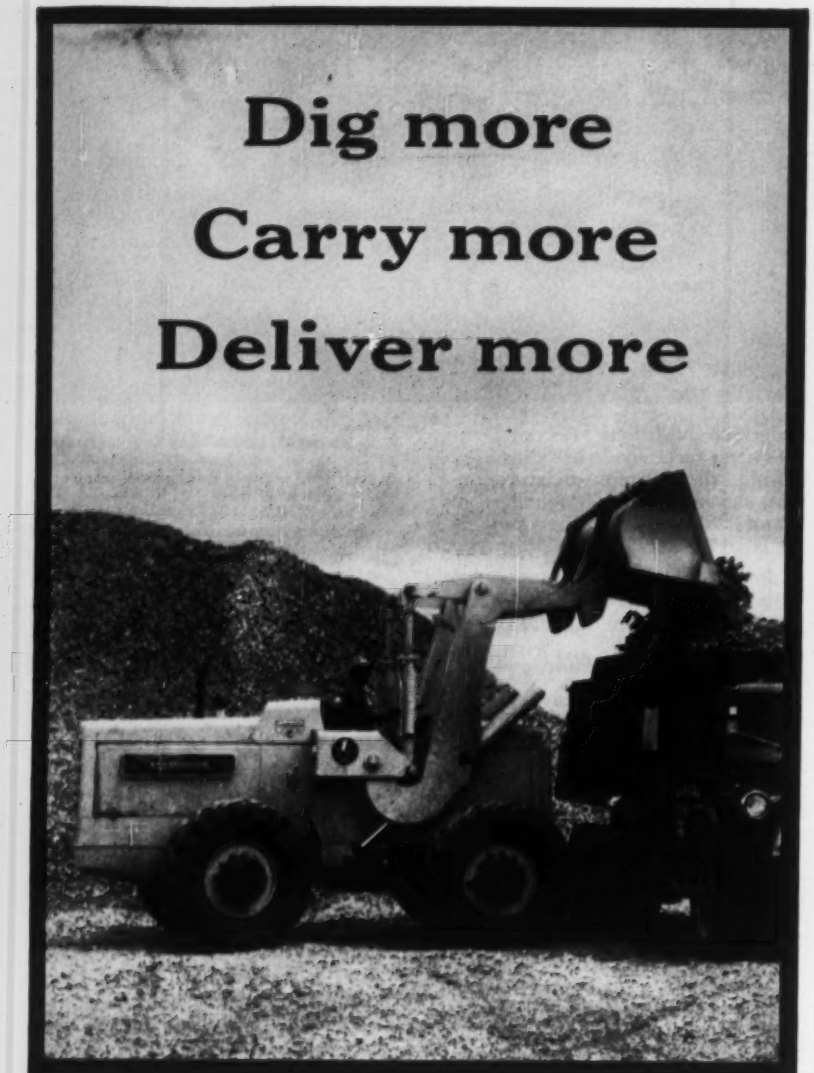

The distinctive pry-out, roll-back bucket action of "PAYLOADER" tractor-shovels is a big reason why they can dig bigger loads, carry them stable and low with less spillage, and deliver more material faster and at less cost than heavier machines. Another BIG reason is the built-in hydraulic load-shock-absorber that cushions the load while carrying—reduces spillage and permits faster carrying speeds.

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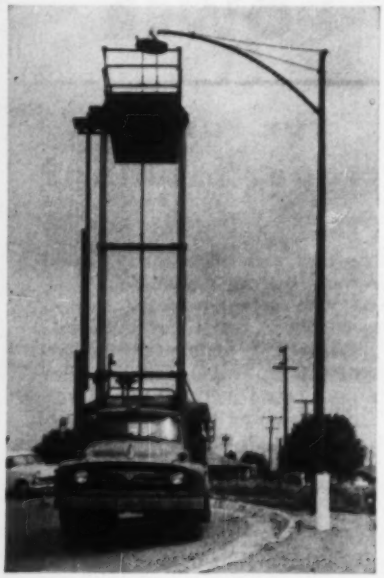


Job-Made Man-Lift

Hydraulically-elevated platform eases task of servicing lights, signs

The Equipment Department of the California Division of Highways has come up with an unusual and highly successful truck-mounted, hydraulically-operated tower lift that is reported to be in constant use servicing overhead lights and signs under jurisdiction of the division.

Mounted on four-ton trucks with platforms installed on hydraulic rams fastened directly to each side of the chassis and behind the cabs, the tower is elevated by a hydraulic pump driven from a power takeoff on the chassis transmission.

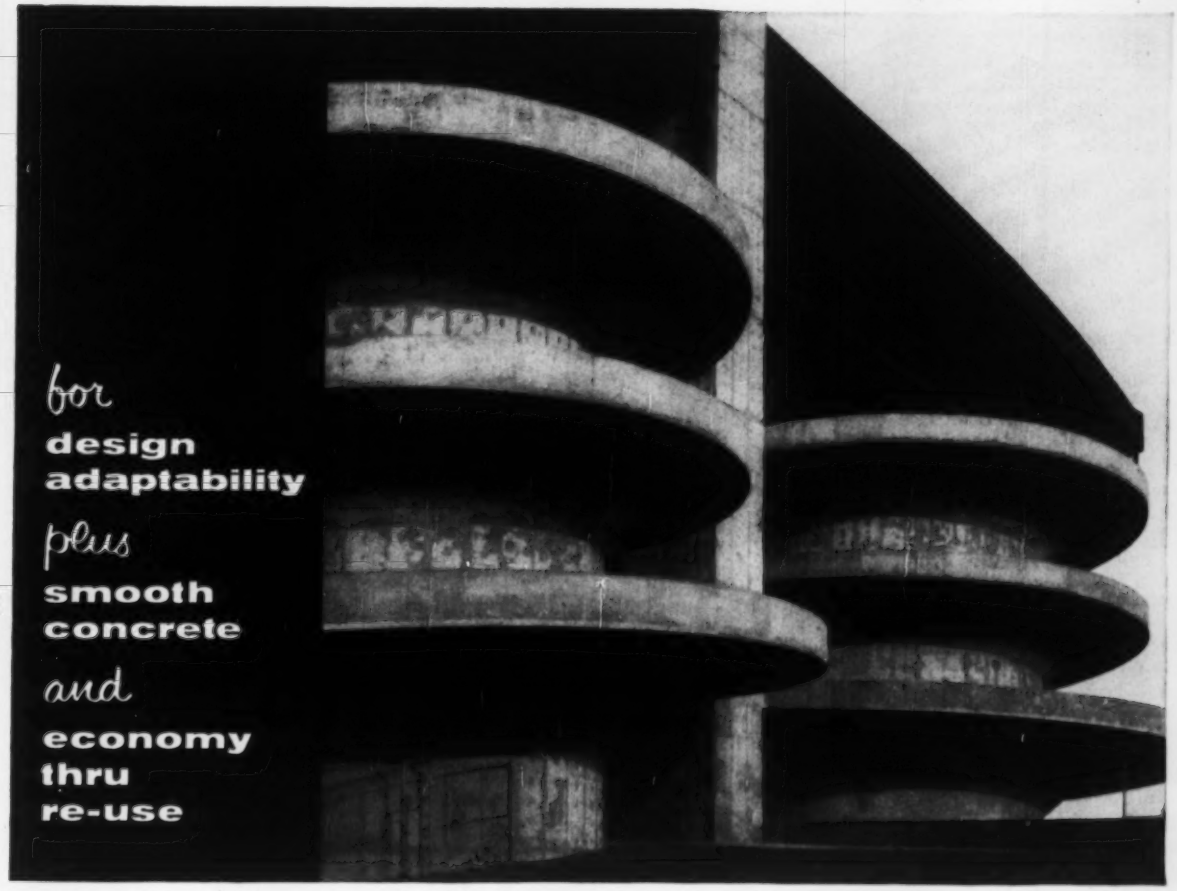
Control of the platform, which includes 360-deg revolution, can be from either the platform or from a second control post directly behind the cab of the truck.

The truck body itself is equipped to transport supplies, necessary tools, materials and the light servicing crew.

A telescoping ladder is provided to provide access to the platform, even at its maximum height of 30 ft.

The equipment department has designed, built and installed special hydraulically operated outriggers that level the unit and provide maximum stability when the tower is used on super-elevated sections of road.

The outriggers have added substantially to the versatility of the equipment.



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FOR YOUR FILES: *New PlyForm Catalog. Contains detailed specification, application, design data. Write (USA Only) Douglas Fir Plywood Association, Tacoma 2, Washington.*

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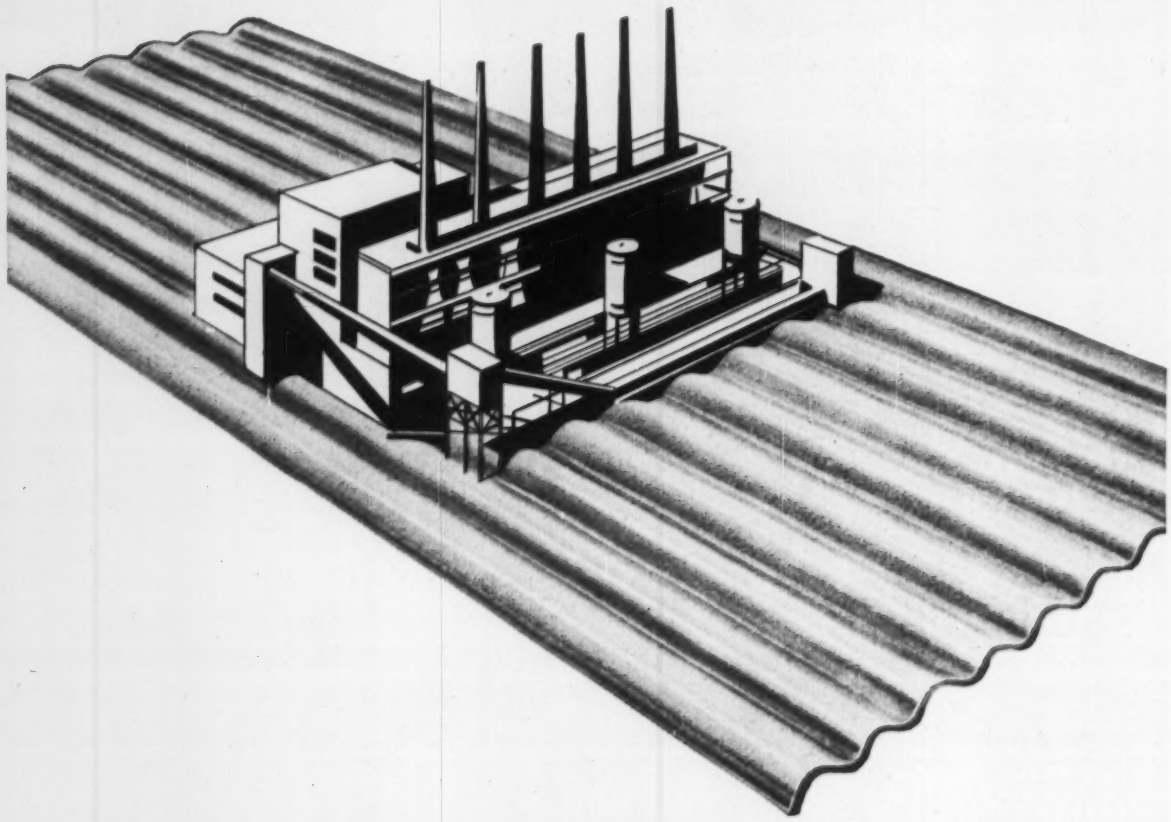
INTERIOR PLYFORM* — standard concrete form grade made with moisture-resistant glue. Gives up to 10 re-uses.

EXTERIOR PLYFORM* — standard form grade made with waterproof glue. Can be re-used as many as 25 times.

***OVERLAID FIR PLYWOOD** — special panel with hard, glossy fused resin-fiber surfaces. Waterproof glue. Gives up to 200 re-uses.



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Low maintenance . . . resistance to acid, fumes, smoke and steam . . . these are the big benefits for power stations with Ruberoid Corrugated Asbestos roofing and siding. Made of inorganic asbestos and cement, these strong sheets never need paint, are completely fireproof, last as long as the building itself.

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ASPHALT AND ASBESTOS BUILDING MATERIALS

Chicago's New Planning Commissioner

Ira J. Bach

This month, Ira J. Bach, executive director of the Chicago Land Clearance Commission, takes over his new job as Commissioner of City Planning. As head of the newly established City Planning Department, Bach will have full cabinet rank in Mayor Richard J. Daley's executive cabinet.

Under the ordinance that created the new department, it will be a working arm of Chicago's municipal government in all kinds of current and future planning. Bach and his 13-man Chicago Plan Commission will be responsible for long-range city planning policy and for making independent review of planning proposals and progress.

The new department will prepare comprehensive plans for physical development of the Windy City. It also takes over the planning and coordinating functions of the Office of Housing and Redevelopment Coordinator, which will be discontinued.

Bach has had long experience in city planning. He practiced architecture for several years in Chicago before entering the housing field in 1942. He served as director of the Tri-County Regional Planning Commission of Denver, then director of planning of the Chicago Housing Authority for a year, then joined the Cook County (Ill.) Housing Authority as executive director, in 1944. Four years later, Bach was appointed executive director of the Chicago Land Clearance Commission.

The 13-man Chicago Plan Commission, replacing the former 35-man commission, will be made up of eight lay members and five public officials. The public officials include, in addition to Bach: The Mayor of Chicago; the President of the Board of Local Improvements; the chairman of the City Council Committee on Planning and Housing, and the chairman of the Committee on Buildings and Zoning.

The lay members will be appointed to staggered terms to assure continuity of long-range planning.

New Officers Are Selected By the Asphalt Institute

R. O. Wilson, of the Cosden Petroleum Corp., Arlington, Tex., has been named chairman of the board of the Asphalt Institute. He succeeds Sidney Goldin of the Shell Oil Co. in New York.

At its annual two-day directors meeting in New York City, the Institute also designated five new regional vice presidents. They are: T. F. McGarey, Cities Service Oil Co., New York; D. H. Jenks Jr., Ashland Oil & Refining Co., Ashland, Ky.; G. L. Farnsworth, Husky Oil Co., Cody, Wyo.; C. Wayne Barbour, Allied Materials Corp., Oklahoma City, and C. V. Kiefer, Shell Oil Co., San Francisco.

New Engineer-Science Council To Be Headed by Phoenix Man

T. A. Phillips of Phoenix, vice-president of Arizona Public Service, is chairman of a new Arizona state-wide organization including all fields of engineering. The organization is known as the Arizona Council of Engineering and Scientific Associations.

Eight specialized technical societies are represented in the group, which will exchange ideas through joint programs, publish a joint news letter and sponsor education projects.

Phillips is an electrical engineer. Other officers include Walter A. Biddle, heating and air conditioning engineer; W. E. MacMorran, electrical engineer, and A. G. Long, mechanical engineer. All are of Phoenix.

Whittelsey Made President Of Ford, Bacon & Davis, Inc.

C. C. Whittelsey has been elected president of Ford, Bacon & Davis, Inc., New York engineering and construction firm. Formerly executive vice president, Whittelsey succeeds E. S. Coldwell, who continues as chairman of the board of directors.

Whittelsey, with the firm since 1926, had charge of the engineering and construction of many of the large-scale projects handled by the company including chemical plants and natural gas pipelines here and in Canada.

He attended Washington University in St. Louis and the Missouri School of Mines.

Two Civilians Retire From Corps of Engineers

Charles C. Cook and James J. Moran, civilian employees of the Corps of Engineers' Omaha District have retired.

Cook, chief of the construction division since 1952, is a veteran of 40 years' service. His successor until Mar. 1, 1958 will be Charles L. Hipp, assistant chief of engineering. The post will then be taken over by Sidney L. Price, who has been engineer in charge of construction at the Grand Forks (N.D.) Air Force Base.

Moran, assistant to the chief of construction, leaves after 33 years of service with the Engineers.

Corps of Engineers District Gets New Construction Chief

L. M. Stephenson has been named chief of the construction division of the Wilmington, N. C., District, U. S. Army Corps of Engineers. He succeeds Paul M. Snell, who has retired.

Stephenson joined the Corps in 1942 after nine years with the North Carolina State Highway Department, the Tennessee Valley Authority and Gulf Oil Corp. He is a graduate of North Carolina State College.

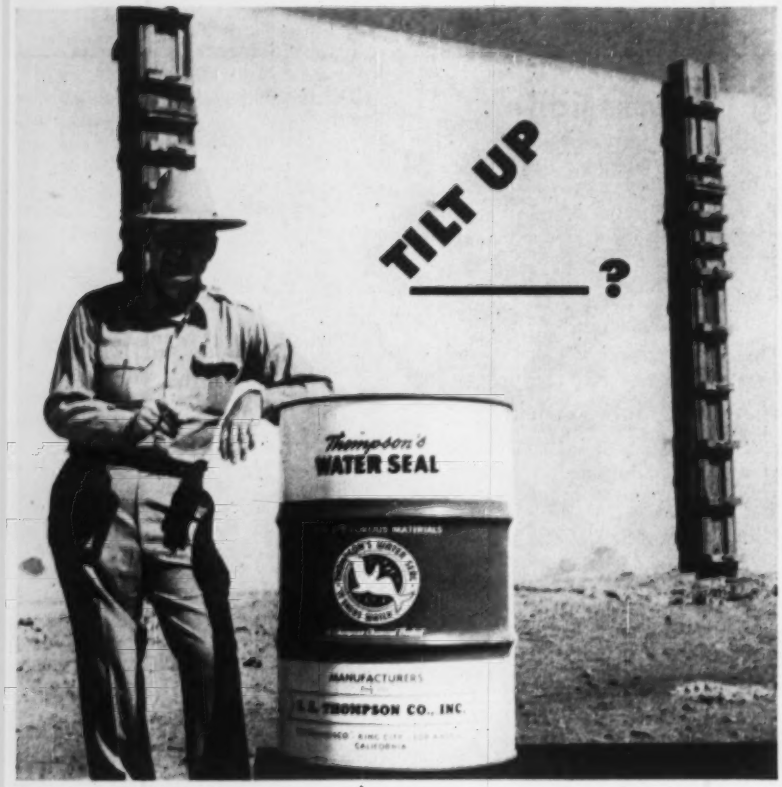
Surgeon General L. E. Burney Named to Interstate Agency

Dr. L. E. Burney, surgeon general of the U.S. Public Health Service, has been named as federal representative on the Ohio River Valley Water Sanitation Commission.

President Eisenhower appointed the former Indiana health commissioner to fill the vacancy created last June when Dr. Leonard A. Scheele resigned as surgeon general. Two other federal representatives to the eight-state compact agency come from the Corps of Engineers and the Department of the Interior.

Dr. Burney is one of the original negotiators and signers of the interstate agreement that created the commission, now headed by Kenneth M. Lloyd as chairman.

(Continued on next page)



here's the West's Answer to your Concrete Questions!

* **What parting compound delivers smooth concrete without leaving stains or residue that interfere with painting?**
"Thompson's Water Seal eliminated the problem of stains in our tilt-up concrete walls. Now panels are easily removed from the surface slab and painting proceeds speedily."
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* **Is there one curing, separating and form-sealing method that easily produces hard, dust-free surfaces?**
"Of all the chemicals we tested in our tilt-up work, Thompson's Water Seal proved the cheapest insurance against costly grief and painting troubles."
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* **Is it possible to prevent all moisture damage in concrete under pressure or capillary action, regardless of weather?**
"As waterproofing specialists in heavy construction work, we use Thompson's Water Seal on all concrete moisture problems with constant success and at a great saving."
STANLEY H. KOLLER CONSTRUCTION, Crockett, Calif.

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. . . Men and Jobs

Griffiths to Be Resident On Rockfill Dam in Iraq

David W. Griffiths has joined Harza Engineering Co., Chicago, and has been assigned as resident engineer for Derbendi Khan Dam in Iraq.

The dam, a $45-million multipurpose project designed by the Harza company, is located on the Diyala River, 150 miles northeast of Baghdad. It will be a 410-ft-high rockfill structure.

Griffiths, who retired as colonel from the Corps of Engineers in 1950 after 31 years of service, had held the posts of district engineer in the Galveston District and the Grecian District in Athens, Greece. Since his retirement he has been with Ambursen Engineering Corp. in Washington, D. C.

Humphreys Resumes Post As Highway Commissioner

Outgoing U.S. Senator Robert Humphreys has resumed his position as Kentucky State Highway Commissioner. He held this post prior to accepting, last June, the Senatorial appointment for an interim term replacement for the late Alvin W. Barkley.

Bert Kiser, who served as highway commissioner during Humphreys' absence, has been appointed administrative assistant to the new head.

Southwest Sales Director Is Named by Walter Kidde

Calvin McCormick, a development engineer and job coordinator since 1945 for Walter Kidde Constructors, Inc., has been named sales director and assistant general manager of the firm's southwest division.

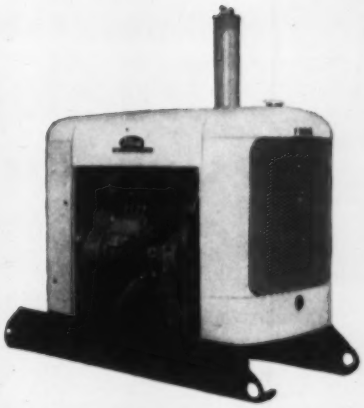
McCormick formerly was associated with Ford, Bacon & Davis, engineers, and York & Sawyer, architects—both of New York. He graduated from Pratt Institute, Brooklyn, and is a registered architect in New York and New Jersey.

City Engineer for Seattle

Accepting the appointment as city engineer for Seattle, Wash., Roy W. Morse has resigned, effective Jan. 1, his Washington, D. C. post as director of the technical review staff of the Department of the Interior.

Morse returns to the city for which he was water superintendent for six years prior to his Washington appointment. A native of Seattle, he received his civil engineering degree from the University of Washington. Morse succeeds William E. Parker.

Announcing
THE
FORD "220" DIESEL
...now available as a complete power unit!



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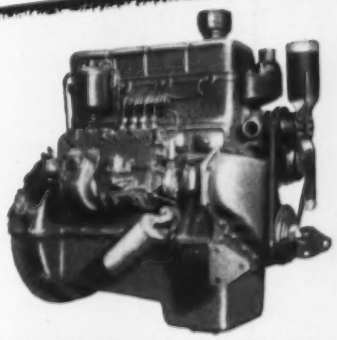
INDUSTRIAL ENGINES
AND POWER UNITS

Looking for really *modern* diesel power? Here it is in one complete 4-cylinder, 220-cu. in., skid-mounted power unit.

Modern design throughout makes this Ford diesel outstanding in power and economy. It delivers more actual sustained power at the flywheel than ever before possible in engines of comparable displacement. Exceptionally rugged in construction, it is quality-built throughout for longer life.

Features such as replaceable cylinder sleeves, aluminum pistons and balanced crankshaft, for example, give you peak performance, longer engine life. Overhead-valve efficiency boosts economy, makes servicing easier.

Drop in and see your Ford Industrial Power Dealer for full information on this modern, super-efficient Ford diesel. Or write: Industrial Engine Department, Ford Division of Ford Motor Company, P.O. Box 598, Dearborn, Michigan.



ENGINE ASSEMBLY

WET CYLINDER SLEEVES
Replaceable cylinder sleeves are positively located, yet easily removable—eliminating costly reboring. Synthetic rubber seal ring at bottom of jacket.

FOUR-WAY INJECTOR
Precision made four-way injector disperses diesel fuel evenly into each cylinder for efficient combustion, more power, and greater fuel economy.

ROTATING EXHAUST VALVES
Exhaust valves are free-turn type, designed to rotate each time valve opens and closes. Makes for even wear, helps maintain compression longer.

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AMERICAN ROAD BUILDERS ASSOCIATION ROAD SHOW
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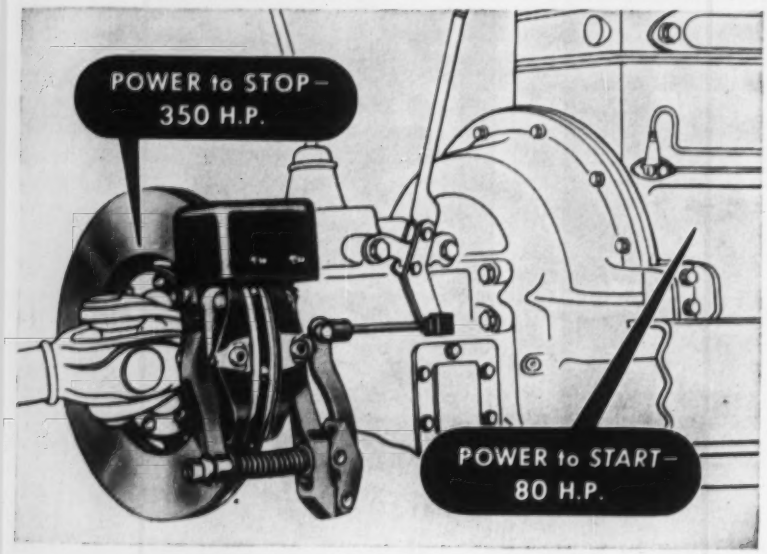
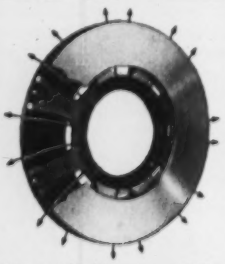


Have the surplus braking power emergency service requires

• In terms of horsepower, brakes actually do more work than the engine. For example:



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• The terrific heat generated in braking shortens lining life. TRU-STOP design quickly dissipates this heat. Most of the disc is exposed to the air even during braking. And a jet of cooling air circulates between the disc blades and carries off heat.

Where it takes 80 H.P. to accelerate to 20 miles per hour, 350 H.P. is required to make a safe stop at that speed within required limits.

TRU-STOP Emergency Brakes have the surplus braking power required for emergency service. That is why they are more adequate for use as parking brakes.

TRU-STOP Brakes lower service costs, too. Relining or adjustment is a simple job for any mechanic with ordinary tools. It is not necessary to drop the drive shaft.

Specify TRU-STOPS for factory installation on the next vehicle you buy. Send for your copy of this booklet —the complete story of TRU-STOP Brakes.

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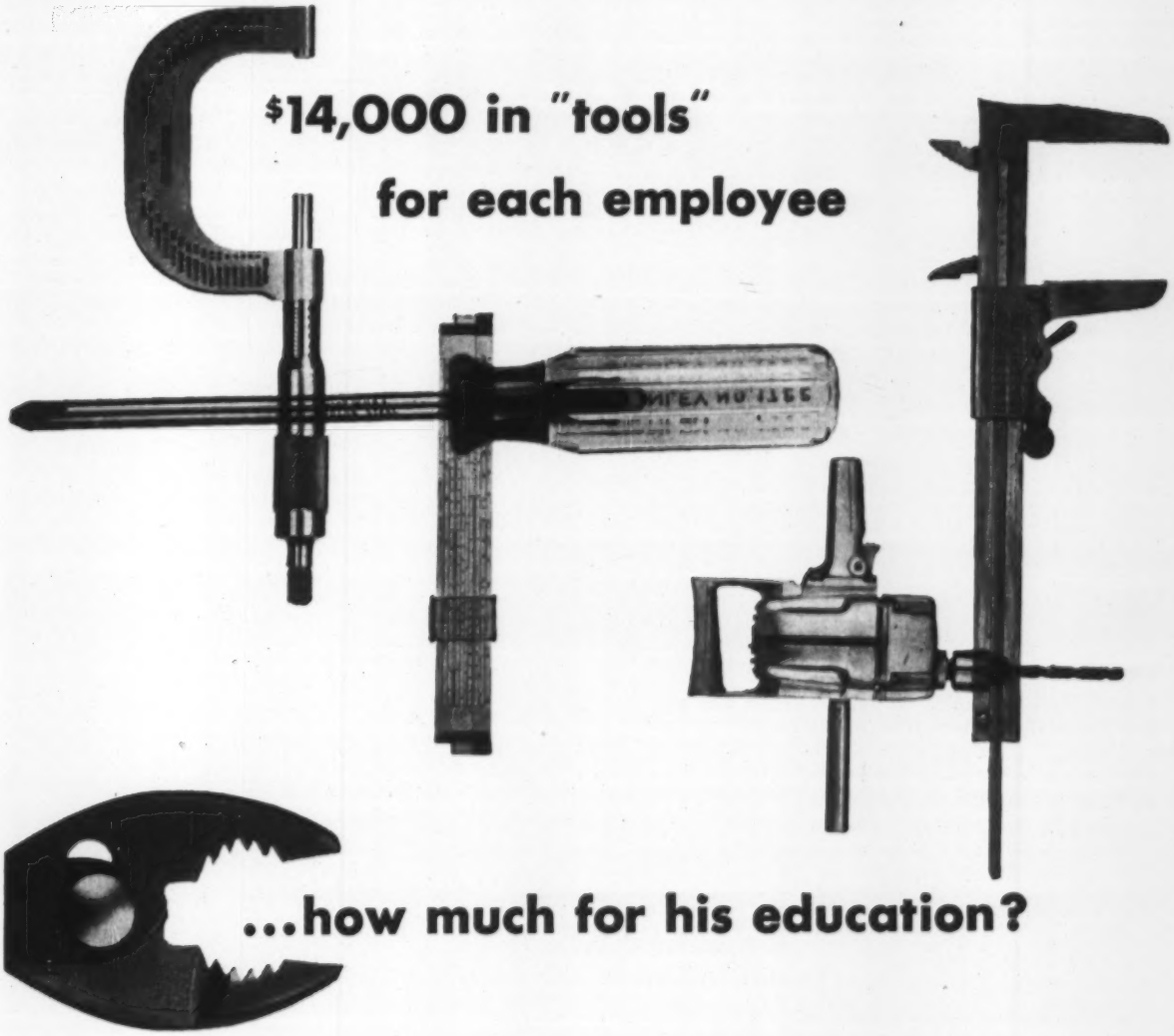
Men and Jobs Briefs

• **Careers**—**Col. Stanley G. Reiff** has been named executive officer for civil works in the office of the Chief of Army Engineers, Washington, D. C. **Col. Roswell P. Rosengren** succeeds Colonel Reiff as chief of the technical liaison division in the Chief's office. . . . **A. Norman Murray** has been appointed assistant regional director of Region 2 of the Bureau of Reclamation with headquarters in Sacramento, Calif. He succeeds **Robert S. Calland,** who is retiring. . . . **Louis Scheipers** has been named city manager of Tarpon Springs, Fla.

• **Business**—**Slaughter, Saville & Blackburn,** industrial engineering consultants of Richmond, Va., and **Brown & Blauvelt,** New York civil engineering firm, have formed the professional partnership of **Blackburn, Brown, and Blauvelt of Richmond** . . . **David T. Anderson,** formerly technical assistant to Philadelphia's municipal board of building standards, is now associated with Albert C. Wood Associates, Philadelphia consulting engineers . . . **Dr. Donald K. Reynolds** has been named executive engineer representing Stanford Research Institute in the Seattle area . . . **Norman B. Jones** has been appointed assistant chief engineer of Ralph M. Parsons Co. in Los Angeles . . . **Wesley W. Webb** of Mason Mich., is now a partner in the Lansing consulting firm of Michigan Associates . . . **David Wallace,** formerly with the Redevelopment Authority of Philadelphia, has been named director of the Greater Baltimore Committee's Planning Council . . . **Robert J. Bliss,** formerly with the Saginaw, Mich., Housing Authority is the new director of the Hartford, Conn., Redevelopment Agency . . . **Raymond E. Layton,** Consulting Engineer, of Hayward, Calif., has changed its name to R. E. Layton & Associates, Consulting Engineers . . . **James W. Follin,** former commissioner of the Urban Renewal Administration of the Federal Housing and Home Finance Agency, is now associated with the engineering firm of DeLeuw, Cather, & Co. . . . **J. L. Mauthe** has been elected chairman of the board of Youngstown Sheet and Tube Co. **A. S. Glossbrenner,** former vice president of operations, succeeds Mauthe as president. . . . **Francis V. duPont** is now associated with the Washington, D. C., firm of Lockwood, Kessler, and Bartlett, as a consultant with offices in Washington, D. C. . . . **John S. Haines,** formerly project manager on the Plattsburg AFB project for the Arthur Venneri Co., has entered into private consulting work in New York.



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Obituaries

Charles Warner, 79, Delaware business and civil leader who once headed a major building materials concern, Warner Co. of Philadelphia, died Dec. 11. A civil engineering graduate of Drexel Institute of Technology, Warner was one of the organizers of the Delaware State Highway Commission, founder and first president of the Wilmington Board of Harbor Commissioners, and held many other state posts in Delaware.

James A. Wilson, 82, retired civil engineer who was on the engineering staff during construction of the Panama Canal and one of New York's East River tunnels, died Dec. 19 in Buffalo, N. Y.

John W. Graham, 72, a civil engineer for the Ohio State Highway Department, died Dec. 13 in Dayton. At one time he served as business manager of the Dayton Board of Education.

Henry A. Mulligan, 69, civil engineer and former treasurer of the Reconstruction Finance Corporation, died Dec. 24 in West Brighton, N. Y. A native of Newburg, W. Va., he was educated at Delaware State University. He went to Staten Island, N. Y., in 1905 as a civil engineer for the Baltimore & Ohio Railroad, and entered the U. S. Customs Service in 1909. After serving overseas with the infantry in World War I, he worked for the Federal Reserve Bank of New York, the War Finance Corporation and the Federal Farm Loan Bureau. He joined the RFC when it was formed in 1932.

William H. Lovejoy, 73, died Dec. 27 at Louisville, Ky. He was the holder of the first waterworks certification issued by the Kentucky State Board of Health and a 1954 winner of the Fuller Award of the American Water Works Association. A 1907 ME graduate of Cornell University—with post-graduate work in chemical engineering also at Cornell—Lovejoy joined the Louisville Water Company in 1908. At the time of his death, he was superintendent of filtration and purification for the company.

Samuel W. Andrews, 66, president of the consulting engineering firm of H. G. Acres Co., Niagara Falls, Ont., died Dec. 31. Born in South Dakota, he joined Acres in 1925 as chief engineer. The company has specialized in water power projects in Canada and Southeast Asia. Andrews became president of company in 1945, and was also a director of Fluor Corp., in Canada and U. S.

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even an insurance company must buy insurance

Helicopter view of Prudential's new Chicago office building

Architects-Engineers; Naess & Murphy, Chicago
General Contractor: Geo. A. Fuller Co.
Plumbing, Sprinkler & Fire Protection: M. J. Carboy Corp., Chicago

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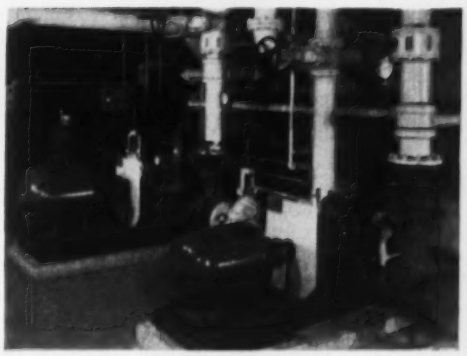
What better example of the complete reliability of Peerless (UL) and <FM> approved fire protection pumps is there than this fact: The Prudential Insurance Co., and their architect-engineers and contractors, selected this dependable equipment as the heart of the fire protection system for their new $40,000,000 Chicago office building.

CONSIDER THIS: When you install an automatic sprinkler system fire insurance premiums are often reduced from 50% to 90%. Thus a pressure-fed fire protection system built around reliable Peerless fire pumps becomes an investment that pays for itself in a few years with substantial cash dividends thereafter.

A 36-page bulletin "Unsurpassed Protection" contains descriptions, selection charts and suggested installation station arrangements of over 120 approved Peerless horizontal fire pumps and accessories and fittings. Write for it today.



Peerless Type TU and TUT approved fire pumps installed in Prudential's new Chicago office building

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Books

P. E. Exam Problems

SUPPLEMENTARY NOTES ON STRUCTURAL PLANNING AND DESIGN—Problems and solutions from past New York P. E. license examinations, by James N. DeSerio, 195 pp, photo-offset reproduction of typescript, plastic-ring bound. Published by James N. DeSerio, 505-511 Root Bldg., Buffalo 2, N. Y. $3.50 ($8.00 combined price includes parent book, Notes on Structural Planning and Design).

This volume presents the author's solutions to problems given from February, 1952, to June, 1956, in Part I, Structural Planning and Design, of New York State's semi-annual professional-engineer licensing examinations.

Together with the parent volume, Notes on Structural Planning and Design (2d ed, 1951, $5), which encompassed the 1941-51 exams, this work is a handy reference for the practicing engineer as well as a "boning-up" guide for the prospective licensee.

While the book is not intended as a primer of structural principles, the clarity and detail of the solutions and sketches will dust off for the engineer-reader most of the fundamentals involved.

Instead of presenting the problems from each exam as a distinct lump, DeSerio has arranged all problems under 15 major headings: beam deflections, steel columns and struts, surveying, foundations, and so on. Within the major divisions, problems are further classified. DeSerio has broadened the supplement by adding a number of problems not included in the exams. Page numbers in the various divisions of the supplement take up where the numbers ended in the parent volume.

According to the author's preface in the original book, the problems comprised the basic content of his twice-yearly refresher lectures, sponsored by the Engineering Society of Buffalo.

Made in France

FRENCH CONTRACTOR EQUIPMENT—BUILDING, CIVIL ENGINEERING, MECHANICAL HANDLING—A special issue of the magazine TRAVAUX prepared in collaboration with the National Association of Equipment Industries. 254 pp. In French and English. Available from SCIENCE & INDUSTRIE, 6 Ave. Pierre-Ier-de-Serbie, Paris (16). 1,500 francs.

The manufacture and use of French construction machinery has made great strides in the past decade, and this volume sets forth this advance in considerable detail. It is divided into three chapters, the first of which deals with the evolution of the equipment and its use on such work as highways, buildings and dams. In the second chapter, the organization of the French equipment manufacturers is explained, the research facilities described. The third chapter is devoted to the application of the various machines to different types of work, earthmoving, drilling, concreting, roadbuilding, hoisting, etc. The book is illustrated with color prints as well as with black and white photographs.

The Runner is the Unifier

Principles of Turbomachinery—By D. G. Shepherd, 463pp. The Macmillan Company, New York

Mr. Shepherd, a professor of mechanical engineering at Cornell University, has a strong conviction that unified treatment instead of the existing piecemeal consideration of turbomachinery is long overdue. His book, written from the viewpoint of the mechanical engineer, attempts to remedy the situation. It pulls together fans, blowers, radial flow and axial flow pumps, compressors, hydraulic turbines, steam turbines and gas turbines.

After first developing some general relationships applicable to all types of turbomachinery, the author studies energy transfer and the laws governing compressible and fluid flow. The second half of the book is devoted to analyzing the various groups of turbomachinery in sufficient detail to allow the major design and performance factors to be appreciated, but again with the different types grouped by similar flow pattern rather than by specific application. Thus the Kaplan turbine is treated together with the steam and gas turbine in a chapter on axial flow turbines.

Civil Engineering Handbook

AMERICAN CIVIL ENGINEERING PRACTICE—Three volumes, edited by Robert W. Abbett. John Wiley & Sons, Inc., New York, N. Y.; Chapman & Hall, Ltd., London. $15 each.

This handbook replaces the American Civil Engineers' Handbook, which was first published in 1910 with Prof. Mansfield Merriman as editor in chief. The older reference work had been revised five times. But advancements in civil engineering practice made it obsolete so that another revision, along the original plan devised by Professor Merriman, could not bring it up to date.

The new handbook was produced as a completely new reference work with changed scope and format.

Major difference between the new and old books is the incorporation in the latest work of fundamentals, in addition to the facts, formulas and tables presented in the older volume. Derivations generally are omitted, but methods not adaptable to mathematical expression are explained and illustrated by examples.

The three volumes contain a total of 34 sections, each devoted to a field of civil engineering. Vol. I covers metropolitan and community planning, surveying, highways, airports, railroads, soil mechanics, earthwork and tunnels and includes mathematical tables. Vol. II is devoted to hydraulic, sanitary and harbor engineering. Vol. III (not yet published) will deal with masonry, reinforced concrete, steel and timber structures.

Miscellaneous Notes . . .

Science and engineering survey—"Science and Engineering in American Industry", final report on a 1953-54 survey by the Bureau of Labor statistics for the National Science Foundation, is now available. Part one of the report deals with research and development costs and personnel. One fact noted in this section is that research and development spending ran about $5 billion in 1953-54. Part two discusses the factors affecting company expenditures for research and development. Included in this section are the results of interviews with top research officers of 200 large corporations. A statistical-table appendix gives detail on specific industries—how research and development is financed and where it is done are among the information given. Also, the tables permit ready comparison of one industry against another. The 120-page booklet may be obtained by writing to the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price is 70 cents.

U. S. water consumption—The U. S. Geological Survey soon will publish a report on "Estimated Use of Water in the U. S.—1955," which breaks down water use figures in the country into the five common classifications: public supplies, rural, irrigation, industry and water power. Until publication, a typewritten copy may be examined in Room 1242-D, GSA Building in Washington, D. C. Its author, Kenneth A. MacKichan, reports a 34% increase in water use since 1950, date of a similar report by MacKichan.

Wrecking the Old to Erect the New

Speeding Feed Mill Project in Virginia

A 25-ton Marion 35-M Truck Crane and a 35-ton Marion 43-M Truck Crane brought down the house with stellar performances as they wrecked a hopper bin tower to make way for a new half-million dollar feed mill in Richmond, Virginia.

That's the 35-M in the foreground, working in really cramped quarters on one of its first jobs. There is no turning space and the 75′ boom is extended over a set of high tension wires. The operator starts a lift, then booms nearly straight up to get the load down behind the wires.

When the 43-M Truck Crane in the background came onto this job, it had already proved its versatility on a variety of other heavy work in the Richmond area.

Whether you're tearing down an old structure or erecting a new one—a Marion Truck Crane can help you do the job faster and more efficiently. See your Marion distributor for the full story about these mobile heavy-duty cranes which can also be equipped with dragline or clamshell front ends.

MARION POWER SHOVEL CO.
Marion, Ohio, U. S. A.

Please send me

Bulletin No. 433 on the Marion 35-M Truck Crane ☐
Bulletin No. 432 on the Marion 43-M Truck Crane ☐

Name _____ Title _____

Company _____

Address _____

City _____ State _____

(129)

Whatever your job requirement, there is a Marion machine of the right size and type for greatest efficiency

MACHINE	SHOVEL CAP. IN CU. YDS.	HOE CAP. IN CU. YDS.	CRANE RATINGS			ASK FOR BULLETIN NO.
			CRAWLER MOUNT MAX.* STABILITY	CRAWLER MOUNT MAX. USABLE	TRUCK MOUNT MAX. USABLE	
MARION 35-M	¾	¾	18T @ 10′	18T @ 10′	25T @ 10′	431
MARION 43-M	1	1-1¼	27T @ 10′	20T @ 12′	35T @ 12′	430
MARION 362	1½	1½-2	43T @ 12′	30T @ 15′		398-D
MARION 87-M	Special Crane		150T @ 12′	75T @ 15′		—
MARION 93-M	2½	—	80T @ 12′	50T @ 15′		397-F
MARION 101-M	3	—	84T @ 12′	57T @ 15′		417-A
MARION 111-M	4	—	169T @ 12′	105T @ 15′		402-C

*For Comparison Purposes Only

"We wanted wall pours that we could complete fast, with forms we could re-use

...THAT'S WHY WE BOUGHT WACO FORMS"

"Let's face it," says Harry Langlois, General superintendent for the Langlois Construction Company of LaGrange, Illinois. "All concrete forms are similar in construction and application. We found, however, that Waco forms had certain features we liked."

"For one thing," he explained, "Waco forms have fewer parts to get lost or misplaced. The more parts there are to the forms, the more time you spend erecting and stripping. Waco forms have only three basic elements . . . the form itself, which comes in a variety of sizes to meet every forming need, a one piece wedge bolt for tieing the forms together, and a one piece waler."

"In the second place," Mr. Langlois continued, "the quality materials and workmanship that go into Waco concrete forms convinced us that these forms would stand up for an above average number of pours. We've used our Waco forms now for the eighth time, and we're more sold on Waco than ever. I suggest that when *you* need forms to rent or buy, you get in touch with your nearby Waco form distributor."

WACO MANUFACTURING COMPANY
3565 Wooddale Avenue • Minneapolis 16, Minnesota

I am interested in your:

( ) Choice distributorships available
( ) Form catalog

Name_____
Firm_____
Address_____
City_____ Zone___ State_____

Unit Prices

Twelve Bids for Georgia Highway

Bids for 11.508 miles of asphaltic concrete highway with two small bridges ranged from $863,844 to $1,260,415. This work for the State Highway Department extends from the Florida state line to Quitman in Brooks County. M. F. Taylor is resident engineer in Valdosta, Georgia.

The contractor, W. L. Robinson Construction Co., College Park, Ga., underbid his nearest competitor by 3.8% and the engineers' estimate by 1.85%.

Plant-mix asphaltic concrete pavement will be placed on a soil-bound macadam base. Curb, gutter and sidewalk are concrete.

Alternate bids were asked on drain pipe. The contract went to class B concrete pipe, while the alternate for corrugated metal pipe received no bids from the three low bidders. Drop inlets and catch basins will be brick having taken the contract away from the option for concrete.

The two bridges are designed for reinforced concrete on precast concrete piles.

Atlanta wage rates are $1.45 for common laborers, $2.80 for hoisting engineers and $3.05 for structural iron workers.

Bidders include:

1C W. L. Robinson Const. Co., College Park, Ga. $863,844
2 D. W. Bailey & Acme Const. Co., Forest Park, Ga. & Cochran, Ga 898,200
12 Ralph E. Mills Co., Frankfort, Ky 1,260,415
EE M. F. Taylor, Resident Engr., Valdosta, Ga 881,568

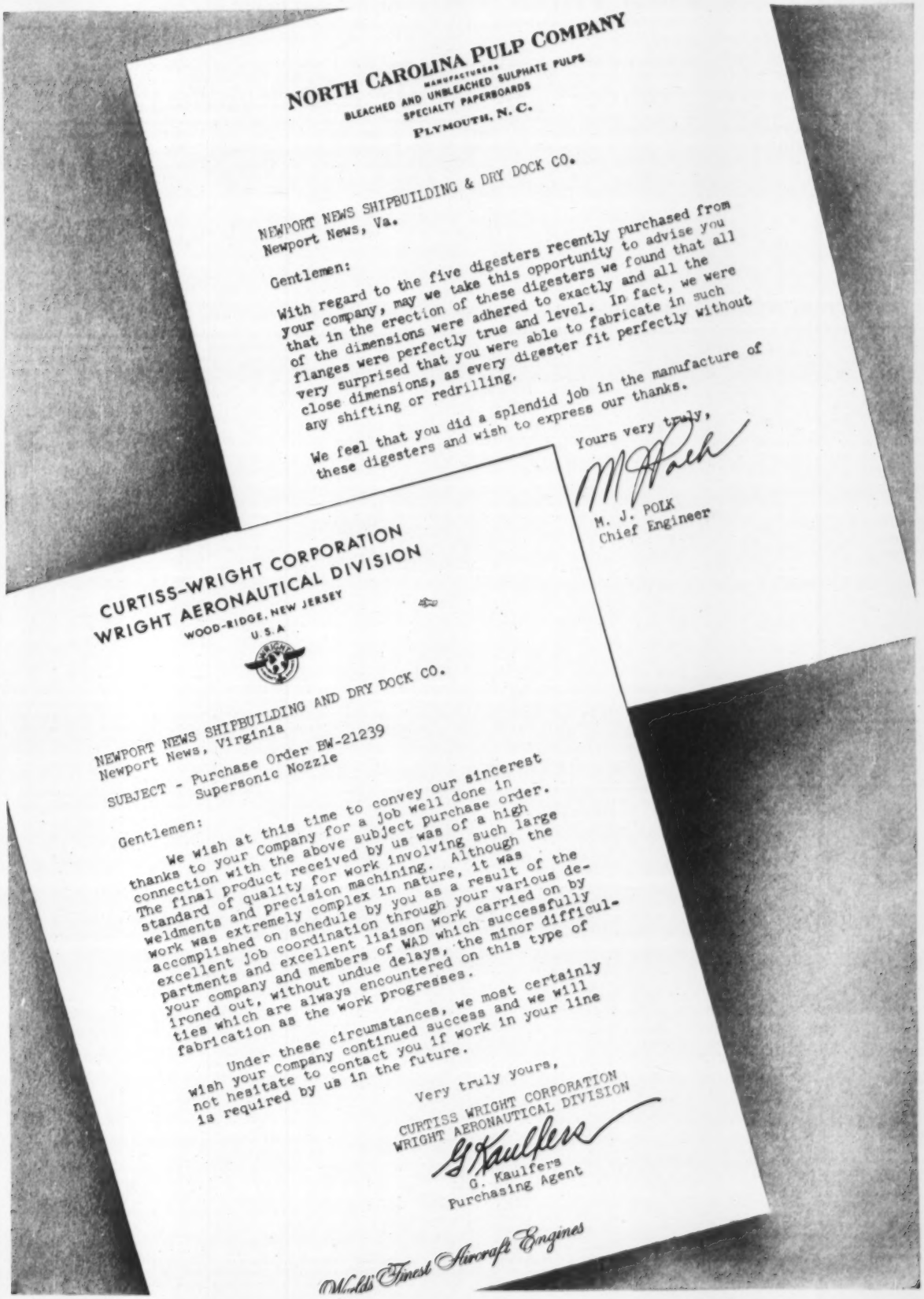
Bids: 12-14-56 Items	Unit	Quantity	Unit Prices 1C	 2
Roadway				
Clear & grub, 185,303 ac	ls	job	$14,000	$32,500
random	ac	4,669	75.00	120.00
Exc, uncl & borrow, incl ditches, shldrs & matl	cy	525,126	0.23	0.255
muck, unsuitbl or unstabl matl	cy	30,733	0.45	0.40
Overhaul on exc	stay	2,354,838	0.002	free
Subgr treatmt matl	cy	8,453	0.40	0.50
Overhaul on subgr treatmt matl, unit yd	ea	65,368	0.03	0.03
Subgr compact, special	lmi	11,506	200.00	200.00
Exc for culv & minor struct	cy	1,970	1.00	1.25
Bkfl, sel matl, for culv fndn	cy	740	1.00	2.00
Conc, cl A, culv well slab & drop inlet cover	cy	710.89	38.00	45.00
cl B, headwalls	cy	60.36	45.00	45.00
Steel, reinf bar	lb	54,021	0.12	0.125
CP, subdr, cl B, 15"	lf	1,500	2.00	2.00
18"	lf	2,580	2.50	2.35
24"	lf	620	4.00	3.90
30"	lf	30	5.00	5.50
Alternate:				
CMP, subdr, 15", 16-ga	lf	1,500		
18", 16-ga	lf	2,580		
24", 14-ga	lf	620		
30", 14-ga	lf	30		
RCP, std str, culv, stub & long, 18"	lf	2,675	3.25	3.10
24"	lf	782	4.75	4.80
30"	lf	781	6.25	6.40
36"	lf	82	7.75	8.95
42"	lf	83	10.50	11.50
24", ext	lf	92	5.00	6.00
CMP, perf, underdr, 6"	lf	1,500		
CP, perf, underdr, 6"	lf	1,500	1.00	1.00
Pipe, culv, remove	lf	636	0.75	0.75
relay	lf	45	1.00	0.75
Riprap, plain sand cmt bag	sy	127.7	5.00	5.50
ROW markers, conc	ea	89	5.00	5.00
FAP markers, plates	ea	2	10.00	10.00
arrows	ea	2	10.00	10.00
posts	ea	2	10.00	10.00
Sprig slopes, shldrs, grass plots & medians	sy	350,101	0.025	0.0225
Riprap, loose sod, for back slopes & subdrains	sy	38,480	0.40	0.50
Block sod flumes	sy	300	0.75	0.70
Water for grassing	Mgal	388.9	2.00	2.00
Fertilizer, 1st applicn	t	32.14	50.00	55.00
2nd applicn	lb	11,249	0.25	0.27
Water meter box, adj to gr	ea	1	10.00	15.00
Drop inlet, adj to gr	ea	1	20.00	25.00
Georgia State marker, remove	ls	job	10.00	25.00
reset	ls	job	10.00	25.00
Culv, conc, remov	cy	2	20.00	25.00
Headwalls, conc, remov	cy	5	15.00	10.00
Catch basins, remov	ea	2	100.00	25.00
Drop inlets, remov	ea	1	75.00	25.00
Valley gutter & curb, conc, remov	sy	29	1.25	0.40
Sidewalk, conc, remov	sy	52	1.00	0.40
Curb & gutt, conc, remov	lf	181	1.00	0.40
Old roads, obliterate	Msf	32	20.00	5.00
CB, conc, std 1013, type A H-4' or less	ea	6	.....	.....
CB, brick, std 1010, type A H-4' or less	ea	6	160.00	200.00
CB, addnl depth	lf	4	25.00	25.00
Drop inlt, std 1019, type A H-4' or less, conc	ea	1		
brick	ea	1	125.00	150.00
type E, H-4' or less, conc	ea	3		
brick	ea	3	125.00	150.00
with spillway, H-4' or less, conc	ea	2		
brick	ea	2	125.00	150.00
Drop inlt, addnl depth	lf	3	20.00	25.00
Gd rail, deep beam type, incl posts	lf	320	4.00	4.00
Approach slabs, reinf conc	sy	265	10.00	10.50
Crse agg for soil bound macadam base	t	47,201	4.13	3.50
Soil mortar, incl matl	cy	23,863	0.50	0.60
overhaul, unit yd	ea	218,647	0.03	0.03
PC, stabilizer matl	bbl	401	5.50	6.00
Asph prime, cutback	gal	63,283	0.15	0.18
Single surf treat, type 1	sy	180,397	0.185	0.21
Asph tack coat AC-8	gal	8,984	0.15	0.13
Binder, hot, A or B	t	19,782	5.40	5.50
Asph conc, E	t	14,757	4.90	5.50
matl, AC-8	gal	432,128	0.115	0.13
Bit bound base for rr cross	sy	41	5.00	2.00
Sidewalk, conc, 4"	sy	643	3.15	3.20
6"	sy	72	4.00	4.50
Valley gutt & curb, conc, 6"	sy	417	4.25	4.50
Curb & gutt, comb, conc, 6x30"	lf	1,294	2.00	2.00
Header curb, conc, 8x14"	lf	2,865	1.50	1.75
Stripe painting	sy	14	3.00	3.00
Finish & dress	sy	168,101	0.02	0.02
Subtotal Roadway			1C $774,122	2 $806,857
Bridges				
Conc, cl A	cy	534	$58.00	$60.00
Steel, reinf bar	lb	127,998	0.13	0.13
Handrailing, conc	lf	703	5.50	4.75
Piles, precast conc, 14" sq	lf	1,095	8.00	8.50
16" sq	lf	1,965	9.00	9.50
Test piles, conc, 14" sq	ea	1	800.00	700.00
16" sq	ea	3	800.00	800.00
Loading tests	ea	2	300.00	100.00
Piles, timber, treat, 16 lb	lf	210	3.50	3.00
Bridge timber, treat, 12 lb	Mbm	1.17	400.00	300.00
Exc, channel	cy	415	1.00	0.75
Clear & grub, 1.222 ac	ls	job	400.00	150.00
random	ac	0.155	200.00	125.00
Riprap, sand cement or plain stone	t	1,700		
	t	850	7.00	7.75
Subtotal Bridges			1C $89,722	2 $91,343

Time to complete: 340 working days

Correction: Luxembourg Steel in Houston Wharf

The steel sheet piling is from Arbed-Belval in Luxembourg for the bulkhead of the wharf for Harris County Navigation District in Houston, Texas.

This corrects the statement in ENR Dec. 12, 1956, p. 215, that German steel was to be used.



NORTH CAROLINA PULP COMPANY
MANUFACTURERS
BLEACHED AND UNBLEACHED SULPHATE PULPS
SPECIALTY PAPERBOARDS
PLYMOUTH, N. C.

NEWPORT NEWS SHIPBUILDING & DRY DOCK CO.
Newport News, Va.

Gentlemen:

With regard to the five digesters recently purchased from your company, may we take this opportunity to advise you that in the erection of these digesters we found that all of the dimensions were adhered to exactly and all the flanges were perfectly true and level. In fact, we were very surprised that you were able to fabricate in such close dimensions, as every digester fit perfectly without any shifting or redrilling.

We feel that you did a splendid job in the manufacture of these digesters and wish to express our thanks.

Yours very truly,

M. J. POLK
Chief Engineer

CURTISS-WRIGHT CORPORATION
WRIGHT AERONAUTICAL DIVISION
WOOD-RIDGE, NEW JERSEY
U. S. A.

NEWPORT NEWS SHIPBUILDING AND DRY DOCK CO.
Newport News, Virginia

SUBJECT - Purchase Order EW-21239
Supersonic Nozzle

Gentlemen:

We wish at this time to convey our sincerest thanks to your Company for a job well done in connection with the above subject purchase order. The final product received by us was of a high standard of quality for work involving such large weldments and precision machining. Although the work was extremely complex in nature, it was accomplished on schedule by you as a result of the excellent job coordination through your various departments and excellent liaison work carried on by your company and members of WAD which successfully ironed out, without undue delays, the minor difficulties which are always encountered on this type of fabrication as the work progresses.

Under these circumstances, we most certainly wish your Company continued success and we will not hesitate to contact you if work in your line is required by us in the future.

Very truly yours,

CURTISS WRIGHT CORPORATION
WRIGHT AERONAUTICAL DIVISION

G. Kaulfers
Purchasing Agent

World's Finest Aircraft Engines

Materials and Labor Prices — November Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Dec 20; Next, Jan 24
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Dec 27; Next, Jan 31
- Wage Rates, Building Board, Lath, Insulation: Last, Jan 4; Next, Jan 31
- Cement, Aggregate, Ready-Mixed Concrete, Asphalt: Last, Jan 11; Next, Feb 7

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES—	PLATE CARBON STEEL	REINF BARS billet	RIVETS ½-in. struc- tural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$5.00	$4.85	$5.075	$10.85	.....	$101.50	$120.00	$6.35	$8.775	$6.025	.....
Chicago Area	5.00	4.85	5.075	10.85	$5.90	101.50	120.00	6.35	8.775	6.025	.....
Pittsburgh Area	5.00	4.85	5.075	10.85	5.90	101.50	120.00	6.35	8.775	6.025	$13.10
Buffalo Area	5.00	4.85	5.075	10.85	5.90	101.50	120.00	6.35	8.775	6.025	13.10
Cleveland	.....	.....	5.075	10.85	5.90	.....	.....	.....	.....	.....	13.10
Youngstown Area	.....	.....	5.075	.....	.....	.....	.....	.....	8.775	.....	.....
Geneva	5.00	4.85	5.175	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	5.70	.....	5.775	.....	5.90	.....	.....	.....	8.775	.....	.....
Pueblo	.....	.....	.....	.....	.....	.....	.....	6.35	8.775	6.025	.....

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot New billet	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot Rail steel	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill
Atlanta	$8.44	.....	$8.90‡	$52.00	$57.00	
Baltimore	8.67	8.10j	.....	42.00	46.50	
Birmingham	8.05l	7.91t	7.91t	65.00p	71.00p	
Boston	8.90u	8.47	8.47	48.00	52.80	
Chicago	8.05	6.81gu	6.81gu	52.00‡	63.00‡	
Cincinnati	8.70ak	8.43re	.....	45.00mn	49.80mn	
Cleveland	8.35	6.79c	.....	43.50‡	48.00‡	
Dallas	9.45	8.25	8.25	49.00	52.00	
Denver	9.60	8.45c	.....	57.00n	63.00n	
Detroit	8.55	8.13	.....	56.00	63.00	
Kansas City	8.87s	8.73	.....	49.00	60.00	
Los Angeles	8.70fd	7.35	.....	57.50	63.50	
Minneapolis	8.45d	8.76b	8.76b	41.50	46.00•	
Montreal	$-8.75cC/8.05-8.45A	7.75/8.95i	7.75/8.95i	65.70k	70.20k	
New Orleans	.....	7.70aks	.....	45.50	50.00	
New York	8.91	7.85xy	7.95y	50.50no	57.00no	
Philadelphia	8.04	7.14	.....	42.50‡	47.00‡	
Pittsburgh	7.43	6.87••	.....	42.50	47.00	
St. Louis	8.48s	7.90c	7.90c	60.00l	62.00l	
San Francisco	8.95	8.90j	.....	47.50	53.00	
Seattle	9.15	8.35•	.....	62.00nr	68.00nr	
Toronto	8.45•	7.60	7.60	56.00nq	59.00nq	

Quantity extras, per cwt: under 100, +$2; 100-399, +$1; 400-999, +50c; 1000-1999, +LOO; 2000-4999, base price; 5000-9999, —10c; 10,000-19,999, —20c; 20,000-29,999, —30c; 30,000 and up, —70c

EXTRAS, per cwt—*Quantity: less than 700ft, +50c; 700-1499, +25c; 1500-2999, +10c; 3000-7999, base price; 8000 and over, —5c. *Size: #2 and smaller, +$2.20; #3, +$1.10; #4, +80c; #5, +55c; #6, +45c; #7, +35c; #8, #9, #10, #11, +35c. *Bending: heavy-incline, +$2 (except in New York City and adjacent metropolitan area where bending must be done on the job). *Engineering (details and placing from designs by others): over 500 tons, +45c; 200-500 tons, +55c; 50-200 tons, +60c but not over $4500; 20-200 tons, +70c but not over $3400; under 20 tons, +85c but not over $70. *Design only: +60c.

*‡ Delivered *a 2000-9999f *b 10,000-19,999f, fob city *c 20 tons or over *d 10,000-19,999f *e Intermediate struct'l *f Incl. delivering in free zone *g CL *h list price; dominion tax exempt; add provincial and municipal taxes *i add dominion, provincial and municipal sales taxes *j Intermediate and hard grade *k fob city *l delivered; contractor to do unloading *m copper alloy *n LCL *o asphalt coated *p del. of 500 sq. yd. or more. *q 3 lb *r 2% off for cash *s 2,000-4,999f *t add 15¢ del. *u add 8.25¢ switch *v incl 15¢ del. *w 5-10 tons *x add 5¢ switch *y add 30¢ del. *z add 10¢ del. *A American made. *C Canadian made. *• Aver. of Canadian & American.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEXa	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 6" Pr Cl. 150	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 12" Sew Cl. I	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13-44T std. 8 in. s.s.	std. 12 in. s.s.	24 in. ds.	38 in. ds.	CLAY DRAIN TILE ASTM C4-24 PER 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTMC 14-41 12 in.	24 in.
Atlanta	123.5	$1.64	$2.68	$.58	$1.00	$4.40	$14.50	$225.00	.....	$0.88m	$3.25m
Baltimore	132.9	1.64	2.48	.665	1.28	5.08v	12.71	187.80	$289.20	1.01	2.75m
Birmingham	119.0	1.64	2.68	.46	.86	3.70w	10.37w	260.00‡	440.00‡	1.25m	2.75
Boston	135.6	1.66	2.46	.788qrf	1.502qrf	6.211qrf	.....	203.40r	312.60r	1.60mg	3.80mg
Chicago	133.4	1.64	2.46	.93m	1.78m	7.82m	21.16m	220.00m	330.00m	1.30	4.00
Cincinnati	128.2	1.66	2.55	.665f	1.282bf	4.905f	12.505	240.00	370.00	.85m	3.25m
Cleveland	134.2	1.66	2.55	.587e	1.0935e	4.545f	11.787f	149.40m	231.60m	.85m	3.50m
Dallas	130.6	1.66	2.80	.430	.799	4.00b	9.17b	.....	.....	.63	1.86
Denver	140.1	1.73	2.80	.47n	.84n	3.73n	.....	.....	.....	.74m	2.50m
Detroit	134.5	1.66	2.55	.85	1.60	6.45	17.50	240.00m	370.00m	.95	3.62
Kansas City	131.1	1.66	2.55	.61	1.105	4.54	12.75	260.00	485.00	.90	2.90
Los Angeles	140.2	1.73	2.46	.74l	1.61l	6.42l	15.36l	360.00l	530.00l	1.02	3.02f
Minneapolis	142.0	1.68	2.68	.85mo	1.55mo	6.70mo	.....	.....	.....	1.76h	4.74h
Montreal	.....	.....	.....	1.02u	1.80u	6.30u	12.00u	.....	.....	1.17h	3.11j
New Orleans	126.1	1.64	2.68	.535	.93	5.44	.....	370.00p	580.00p	.85	2.90
New York	131.4	1.66	2.46	.90	1.88	7.37	19.06	.....	.....	1.50	3.00
Philadelphia	130.8	1.64	2.46	.65	1.25	4.95r	12.65r	300.00‡	350.00‡	1.60h	3.95h
Pittsburgh	135.3	1.66	2.46	.468m	.864m	3.86m	9.78m	152.00	244.00	1.05h	2.50h
St. Louis	129.6	1.64	2.55	.59	1.08	4.45	10.80	180.00l	380.00l	1.45il	3.10il
San Francisco	140.2	1.73	2.46	.74d	1.62d	6.59d	16.47d	320.00l	530.00l	1.05m	3.30m
Seattle	140.8	1.73	2.46	.66b	1.26b	6.65	18.80	220.00c	.....	1.00k	3.10k
Toronto	.....	.....	.....	.76	1.425	6.00	.....	187.00	280.00	.87	3.05

*‡ Delivered. *a PRICE INDEXES for CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 119.0; Burlington, N. J., 127.8. *b Extra strength ASTM C 200-44T *c 4-in., $113 *d SS361-A *e 30-in. *f 21 in. *g culvert pipe; reinforced, ASTM C 76-41 *h reinforced, ASTM C 75-41 *i reinforced, ASTM C 76-37 *j centrispun; no standard specs. in Canada *k 2% off for cash *l fob plant *m truck delivery *n LCL delivered, fob truck *o listed price based on LCL (no min.) *p freight allowed to destination in city *q ASTM C 13-40 *r CL fob origin, freight allowed *s 2 ft lengths *t 3 ft lengths *u CESA A 60-1941 specs, used *v standard strength *w ss; add 20% for d.s.

*WROUGHT STEEL PIPE

(Full standard weight)

Discount from list; see footnote

Mill	Black %	Galv. %	Black %	Galv. %	Black %	Galv. %
	1/8 to 1/2 in., Lap Weld		3/4 to 3 in., Butt Weld		3½ & 4 in., Butt Weld	
Lorain, Ohio	23.00	+0.75a	23.00	4.75	23.00	4.75
Aliquippa, Pa.	23.00	+11.25	23.00	9.25	23.00	5.75
Sparrows Pt., Md.	21.00		22.00	2.75	23.00	9.25
Beaver Falls, Pa.	23.00	+0.75	23.00	4.75	23.00	4.75
Beaver Falls, Pa.	13.50a	+6.25a	13.50a	3.75	13.50a	3.75
Beaver Falls, Pa.	12.50ab		13.50		13.50a	+4.25a
Beaver Falls, Pa.			7.50a		11.75d	+2.50d
Beaver Falls, Pa.					1.00ab	+17.75ab
Beaverwood, W. Va.	23.00	+0.75	23.00	4.75	23.00	4.75
Youngstown, O.	23.00	+6.25	23.00	9.25	23.00	5.75
Indiana Harbor, Ind.	22.00		22.00	2.75	23.00	9.25
Sharon, Pa.	23.00	+4.25a	23.00	4.75	23.00	4.75
Wheatland, Pa.	23.00	+2.50d	23.00	5.75	23.00	5.75
Etna, Pa.	23.00	+17.75ab	23.00	9.25	23.00	9.25
Fontana, Calif.	10.50b		10.50b	+7.75b	23.00	5.75

† Threaded and coupled. a 3½ to 4 in. b Continuous weld. 5 and 6 in. d 6 in.

* **WROUGHT STEEL PIPE:** Deduct discounts shown above from the following standard list consumers carload prices to get mill price. List prices per ft. (based on approx. $200 per net ton): Butt Weld ⅛ in., 8½¢; ¼ in., 6¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 76½¢. Lap Weld 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight rates plus 3% transportation tax to get destination price.

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld—1 in. black, + 85.54, galv., + 95.77; 1¼ in. black, + 88.54, galv. + 95.23, 1½ in. black, + 81.79 galv. + 91.22; Lap Weld —2½ in. to 3 in. black + 67.95 galv. + 95.77; 4½ in. to 6 in. black + 84.74 galv. + 90.68 Add freight rates plus 3% transportation tax to get destination price.

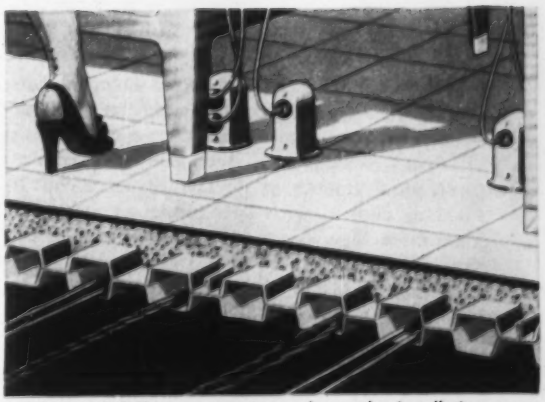
Fine new buildings with Robertson Q-Floor will stay young in the decades to come thanks to complete electrical availability

The Mid-America Home Office
PRUDENTIAL INSURANCE CO.
Chicago, Ill.
Naess & Murphy, Architects & Engineers
Geo. A. Fuller Co., General Contractor

When you build with Robertson Q-Floor you assure a long and useful life for your building since you will have provided for any conceivable amount of office automation. The large steel cellular raceways in Robertson Q-Floor, on six-inch centers, make it possible to run wires for electrical and telephone outlets to any point in the building quickly and inexpensively. Thus, no matter how many electrical devices are added or moved, the Q-Floor building will have adequate electrical facilities.

Not only does Q-Floor provide complete flexibility of electrical outlets, but it also saves construction time and money. Weight saved in the floor itself means lesser loads and savings in the supporting foundations and structural steel. And during construction, Q-Floor immediately becomes a safe, fireproof working platform for all trades.

Build for the future while keeping an eye on today's costs by using Robertson Q-Floor. Use the coupon to write for the new 44-page Q-Floor Manual.



Cellular steel Q-Floor construction makes outlet installation easy—provides 100% electrical availability.

Today's finest buildings are built with **Robertson**

Q-Floor

the original cellular steel floor

H. H. Robertson Company

2420 Farmers Bank Building, Pittsburgh 22, Pa.
In England—Robertson Thain Ltd., Ellesmere Port, Cheshire
In Canada—Robertson-Irwin Ltd., Hamilton, Ontario

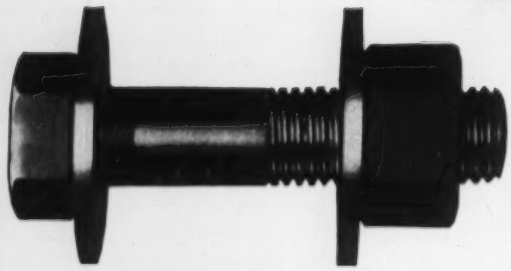
Please send 44-page Q-Floor Manual.

NAME

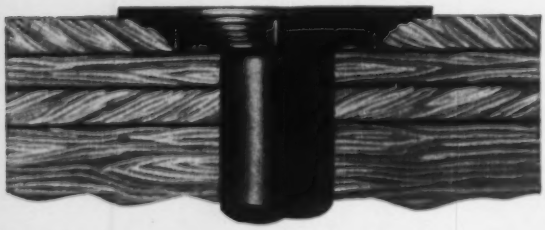
COMPANY

ADDRESS

THREADED RODS. Two types, cut threads and rolled threads. Cut-thread rods are furnished plain or upset, in thread diameters up to and including 4½ in. Rods with rolled threads are produced in thread diameters up to and including 1½ in. Each type of rod can be supplied in a wide range of lengths, and with black asphaltum coating, if desired.



HIGH-STRENGTH BOLT. Saves erection time, as bolt can be installed cold by means of a holding wrench and pneumatic impact wrench. Bolt is made of carbon steel, and is quenched and tempered to meet requirements of ASTM Specification A-325. Used as shown, with two hardened washers. Also ideal for bridge construction, as it provides connection so tight that it effectively resists effects of vibration. Made in diameters from ½ in. to 1¼ in. Furnished in all lengths.



PLYWOOD BOLT. This bolt provides 50 pct more bearing surface under the head than a carriage bolt of equal size. Closely spaced spirals under the head, reversed against the threads, provide a water-tight joint, retarding dry rot. Flat head provides a flush surface which does not damage wood.

Fasteners

THAT GRIP FIRMLY ...AND HOLD ON

Here are three types of fasteners, selected at random from among the wide range of fasteners produced by Bethlehem for the construction industry. Like all Bethlehem fasteners, they can be counted on for firm grip, and dependable performance. Whether you're looking for these items, or fasteners of some other type, you can be pretty sure that we either have the style and size you want, or can make it for you quickly. Just get in touch with the nearest Bethlehem sales office about your requirements.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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BETHLEHEM STEEL

Bethlehem Bolts Are Good Bolts

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

† **Mass., Falmouth**—ROADS—BA 1/23—U. S. Eng., 150 Causeway St., Boston, roads and utilities, Otis Air Force Base, ENG-19-016-57-134. $600,000-$700,000. Plans deposit $10, refundable. CD 12/28.

† **Mass., Falmouth**—APRON ELECTRIC OUTLET—BA 1/24—U. S. Eng., 150 Causeway St., Boston, apron electric outlet grid sys., facilities, Otis Air Force Base, ENG-19-016-57-136. $200,000-$225,000. Plans deposit $10. CD 12/28.

† **Mass., Falmouth**—DINING HALL—BA 1/25—U. S. Eng., 150 Causeway St., Boston, airmen's dining hall, Otis Air Force Base, ENG-19-016-57-137. $300,000-$350,000. Plans deposit $10. CD 12/26.

BUILDINGS—SLC

Mass., Newburyport—HOSPITAL—Worcester Memorial Hospital, c/o Leo. L. Sheinfeld, archt., 7 Water St., Boston, soon lets contract hospital alterations, modernization, 277 High St. $500,000.

HEAVY CONSTRUCTION—LB & CA

VERMONT—State Dpt. Hys., State Office Bldg., Montpelier,
rejected bids Dec. 14, bridges and widening bridges, Vt. Rte. 113, S-176 (8), Vershire, LB **$231,553**, est. $185,000. Will re-advertise. CD 12/19, under LB.

RHODE ISLAND—State R. I. & Prov. Plants, Div. Purchase, State House, Providence.

M. A. Gammino Constr. Co., 728 Valley St., Providence, R. I., LB **$469,428**, est. $500,000. b. conc., Phenix and Natic Aves., Contr. 5625. FAS Proj. S-0223 (2), Cranston.

† **The Lane Constr. Corp.**, 965 E. Main St., Meriden, Conn., CA **$933,672**, constr. pavements and utilities, Bradley Field, ENG-19-016-57-74B, WINDSOR LOCKS, CONN. U. S. Eng., 150 Causeway St., Boston 15, Mass. Bids Nov. 27. CD 11/1.

BUILDINGS—LB & CA

Vermont Junior College, College Ave., Montpelier, Vt., rejected bids Dec. 4, DORMITORY "A" and CENTRAL HALL "B", MONTPELIER, VT. LB **$752,333**, est. $500,000. Sturgis Assoc., Inc., 120 Boylston St., Boston, Mass., archt. CD 12/10, under LB.

A. R. Green & Son, Inc., 19 St. James Ave., Holyoke, Mass. CA **$698,775**. general constr. FACTORY and OFFICE, Appleton and Winter Sts., HOLYOKE, MASS. American Pad & Paper Co., 88 Winter St., Holyoke, Mass. Bids Dec. 27, CD 12/5;
Haarmann Steel Co., Holyoke, Mass. CA **$131,172**. structural steel (Holyoke, Mass.)

▲ **A. F. Peaslee, Inc.**, 15 Lewis St., Hartford, Conn. LB **$2,192,714**, (2 bidders) REGIONAL HIGH SCHOOL and AGRICULTURAL BLDG., Barkhamsted, Colebrook, Norfolk and New Hartford, WINSTED, CONN. Regional School Dist. 7, Office Rural Supt., 384 Main St., Winsted, Conn. Bids Jan. 4. CD 12/12.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **Pa., Pittsburgh**—SCHOOL—BA 1/31—School Dist. of West Mifflin, 1 story, 72x380 ft., 66x266 ft., brick, block Clara Barton Elementary School, $1,237,481, Button & McLean, 119 E. Montgomery St., Pittsburgh, archts. CD 9/24, under LB.

▲ **N. J., Jersey City**—APARTMENT—BA 2/5—Jersey City Housing Auth., City Hall, 2 thirteen story and 5 fourteen story apartments, $10,000,000. CD 9/17.

▲ **N. Y., New York**—BA 2/7—Director Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. Junior High School 22, Sheriff St. between Stanton and Houston Sts., Manhattan Boro. Extended date. CD 12/19.

BUILDINGS—SLC

Pa., Springfield—SHOPPING CENTER—Owner, c/o George W. Neff & Leonard Evantash, archts., 1520 Locust St., Phila., soon lets contract, shopping center, State and Sproul Rds. $800,000.

HEAVY CONSTRUCTION—LB & CA

† **Buck & Donohue, Inc.**, 790 Broad St., Newark, N. J. CA **$608,615**. North Branch-Susquehanna River Flood Control Proj., Endicott, Johnson City and Vestal, Unit No. 1 at Westover, NEW YORK. U. S. Eng., 111 E. 16 St., New York 3, N. Y. CD 12/31, under LB.

† **Gasparini Excavating Co., Inc.**, Peckville, Pa. CA **$857,239**. North Branch-Susquehanna River Flood Control Proj., Endicott, Johnson City and Vestal, Unit No. 3 at Endicott, NEW YORK. U. S. Eng., 1111 E. 16 St., New York 3, N. Y. CD 12/26, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg.

Pa.—H. J. Williams Co., Inc., 150 S. Sumner St., York, Pa. LB **$3,028,298** (11 bidders) constr. 38,862 ft. divided hy. of rein.-con. 24 ft. wide each side earth divisor, 6 bridges, Hopewell and Shrewsbury Twpt., T.R. 111, York Co.; LB **$3,082,528** (9 bidders) constr. 33,987 ft. divided hy. of rein.-con. 24 ft. wide each side earth divisor, 4 bridges, Shrewsbury and Springfield Twps., T.R. 111, York Co.;

Pa.—James D. Morrissey, Inc., 9119 Frankford Ave., Phila., Pa. LB **$2,368,660** (5 bidders) constr. 19,438 ft. divided hy. of rein.-con. 24 ft. wide each side divisor, six I beam bridges, Upper Dublin and Lower Gwynedd Twps., T.R. 309, Montgomery Co.;

Pa.—John H. Swanger, Inc., Box 1214, Lancaster, Pa. LB **$2,198,453** (8 bidders) constr. 13,007 ft. crushed aggregate base with bit. surf. 24 ft. wide, 1 prestressed, precast rein.-con. bridge deck, W. Hempfield and E. Donegal Twps., Columbia and Marietta Boros, T.R. 441, Lancaster Co.;

Pa.—Dinardo, Inc., 331 Bouquet St., Pittsburgh, Pa. LB **$1,134,713** (3 bidders) constr. 10,680 ft. c. conc. with bit. surf. Pittsburgh City, Midvale Boro, T.R. 8 and 28, Allegheny Co.;

Pa.—Indyke Bros. Constr. Co., 539 Vermont St., McKeesport, Pa. LB **$1,112,815** (3 bidders) wid'n. 17,290 ft. existing road with plain, c. conc. O'Hara and Harmar Twps., Allegheny Co.;

Pa.—Frank Mashuda Companies Associated, Evans City, Pa. LB **$1,186,640** (7 bidders) constr. 17,838 ft. rein.-con. pavement, one I-beam plate girder bridge, N. Beaver Twp., New Castle City, T.R. 18, Lawrence Co.;

Pa.—Kingston Contg. Co., West Point, Pa. LB **$1,056,562** (3 bidders) constr. 10,175 ft. divided hy. of rein.-con. 22 ft. wide each side concrete divisor, 3 bridges Allentown City, Salisbury Twp., T.R. 29, Lehigh Co.;

Pa.—J. Paul Laubach, Box 68, Benton, Pa. LB **$847,141** (3 bidders) constr. 28,484 ft. crushed aggregate base with bit. surf. 22 ft. wide, 6 bridges, Jackson and Wells Twps., T.R. 549, Tioga and Bradford Counties;

Pa.—N. B. Putman Co., Honesdale, Pa. LB **$515,605** (5 bidders) constr. 29,761 ft. crushed aggregate base bit. surf. 20 ft. wide, 3 rein.-con. bridges, Lenox Twp., T.R. 92, Susquehanna Co. Bids Jan. 4. CD 12/18.

▲† **Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Iowa. CA **$3,586,575**. dredging Delaware River, Philadelphia and Bucks Counties, ENG.-36-109-57-15, PENNSYLVANIA. U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. CD 12/12, under LB.

▲ **Braunn & Stuart**, Suburban Station Bldg., Phila., Pa., CA **$1,792,500**. substructure extension and retaining wall, Piers 38 and 40, PHILA., PA. City, Dpt. Procurement, City Hall Annex, Phila., Pa. Bids Dec. 21. CD 11/27.

▲ **Conduit & Foundations Corp.**, 158 N. 20 St., Phila., Pa. CA **$1,387,613**. storm drainage sys., pumping station, Frankford Arsenal, ENG.-36-109-57-12, PHILA., PA. U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. CD 12/10, under LB.

▲ **General Asphalt Paving Co.**, Rising Sun and Glenview Ave., Phila., Pa., LB **$1,201,484**. Henry Ave. grading, paving, Bid 3930, PHILA., PA. City, Dpt. Procurement ,City Hall Annex, Phila., Pa. Bids Dec. 13. CD 11/14.

Intercounty Constr. Co., 4720 Baltimore Ave., Hyattsville, Md., CA **$278,155** (11 bidders) stormwater and service sewers, Rockwood Parkway, Dalecarlia Reservation to Glenbrook Rd. N. W., WASH., D. C. D. C. Govt., Dpt. Sanitary Eng., 499 Pa. Ave. N. W., Wash., D. C. Bids Dec. 28. CD 12/17.

† **Jaggard & Hickman**, Marlton, N. J., CA **$254,350**. jetty and bulkhead rehabilitation, Indian River inlet, ENG.-36-109-57-52, Sussex Co., DELAWARE. Dpt. Army, 2635 Abbottsford Rd., Phila., Pa. Bids Dec. 20. CD 12/19.

BUILDINGS—LB & CA

▲† **Paul Tishman, Inc.**, 21 E. 70 St., New York, N. Y. CA **$10,331,000**. Army HOSPITAL, FORT DIX, N. J. U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. Ziegler Childs & Paulsen, 921 Bergen Ave., Jersey City, N. J., archts.-engrs. Bids Dec. 19. CD 11/15.

▲ **Carl J. Del Spina Co.**, 347 Main St., Orange, N. J. Owner Builds. **$1,500,000**. OFFICE, Main and Bell Sts., ORANGE, N. J. Geo. Dissman, 535 Grant Ave. East, Roselle, N. J., and Trizett & Dissman, Orange, N. J., archts.

▲ **A. M. F. Atomics, Inc., Division of American Machine & Foundry Co.**, 261 Madison Ave., New York 16, N. Y. CA. **$2,700,000**. design and constr. INDUSTRIAL RESEARCH REACTOR, PLAINSBORO, N. J. Industrial Reactor Laboratories, Inc., c/o engineer-contractor. Atomic Energy Comm. issued permit.

William C. Ehret, 1723 N. Olden Ave., Trenton, N. J., CA. **$400,000**. FIELD HOUSE addn., LAWRENCEVILLE, N. J. Lawrenceville N. J. School, Lawrenceville, N. J. Livingston Smith, 1601 Chestnut St., Phila., Pa., archt. Robert E. McLaughlin, 1411 Walnut St., Phila., Pa., engr.

▲ **John W. Ryan Constr. Co., Inc.**, 11 W. 42nd St., New York, N. Y., CA **$3,000,000**. OFFICE BLDG., sewerage disposal sys., paving, Lawrence Twp., PRINCETON, N. J. Educational Testing Service, 20 Nassau St., Princeton, N. J. Edwards & Hjorth, 76 W. 44th St., New York, N. Y., engr. CD 5/18/55.

Roxbury Hill Homes, c/o Harry L. Schwarz & Co., 28 N. Sussex St., Dover, N. J. Owner Builds. **$960,000**. 60 HOUSES on tract at Eyland Ave., SUCCASANNA, N. J.

Eastern Eng. Co., 345 N. Georgia Ave., Atlantic City, N. J., CA **$600,000**. 2 story, bsmnt., brick, steel SERVICE BLDG. addns., alterations, TRENTON, N. J. Mercer Hospital, 446 Bellevue Ave., Trenton, N. J. Bids Nov. 14. CD 11/15.

▲ **Praver Trenton Co.**, Rte. 33, Trenton, N. J., CA **$1,200,000**. 100 RESIDENTIAL DEVELOPMENT, Perro Pl., TRENTON, N. J. Bo Jan Realty Corp., Arnold & Robert Praver Sts., Rte. 33, Trenton, N. J.

▲ **Louis & Earl Cahan**, 140 W. State St., Trenton, N. J. Separate Contracts. **$1,500,000**. 14 story, brick APARTMENT, 130 units, 2 shops and luncheonette, TRENTON, N. J.

L-D Building Co., Latrobe, Pa. CA **$397,780**. 3 story, bsmnt., 40x140 ft., steel, brick MUSEUM, GREENSBURG, PA. Westmoreland County Museum of Art, Greensburg, Pa. Bids Dec. 14. CD 11/28.

▲ **Graziano Constr. Co.**, 7321 Frankstown Ave., Pittsburgh, Pa. CA **$2,098,000**. 1 and 2 story, masonry SENIOR HIGH SCHOOL, MONROEVILLE, PA. School Auth. of Monroeville, Turtle Creek, Pa. CD 11/30, under LB.

Phila. Northeast Contractors, Craig and Stanwood Sts., Phila., Pa. CA **$750,000**. 1 story, mezzanine, brick, block, 45,000 sq. ft. steel MANUFACTURING and WAREHOUSE, PHILA., PA. U. S. Rubber Co., Cottman and Keystone Sts., Phila., Pa. Bids Dec. 6. CD 11/23.

▲ **Rosemore Building Co.**, Att. C. Helms, 1518 Walnut St., Phila., Pa. Separate Contracts. **$1,000,000**. RESIDENTIAL DEVELOPMENT, 50 units, Dixon St., RYDAL, PA.

Martin Bros., 1609 Connecticut Ave. N.W., Wash., D. C., CA **$894,850** (6 bidders) CHURCH addn., 3405 Nebraska Ave. N.W., WASH., D. C. Metropolitan Memorial Methodist Church, Nebraska and Mexico Aves. N.W., Wash., D. C. Chatelain, Gauger & Nolan, 1632 K St. N.W., Wash., D. C., archts. Bids July 3, awarded Jan. 1. CD 7/13, under LB.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England — **Middle West**
Middle Atlantic — **West of Mississippi**
South — **Far West**

PROPOSED WORK
Water Supply — **Public Buildings**
Sewers, Waste Disposal — **Mass Housing**
Bridges — **Commercial Buildings**
Streets & Roads — **Industrial Buildings**
Earthwork, Waterways — **Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

THE ILLINOIS STATE TOLL HIGHWAY COMMISSION

Northern Illinois Toll Highway

ADVERTISEMENT FOR BIDS

Bids to be Opened February 7, 1957

CONTRACT T-7A

Work to be done under this Contract shall be commenced on April 1, 1957, or on such earlier date as may be mutually agreed upon, between the Commission and the Contractor. All work under this Contract shall be completed on or before December 15, 1958 and consists of:

Grading, drainage, paving, the construction of appurtenances, and the erection of precast concrete and steel bridges for approximately 4.75 miles of the Tri-State Route of the Northern Illinois Toll Highway in Construction Section T-7A in Cook Co., Ill.

Roadway Excavation	175,000 Cu. Yds.
Borrow	2,200,000 Cu. Yds.
Selected Subgrade	92,000 Cu. Yds.
Granular Subbase	57,000 Cu.Yds.
10" Reinforced P.C.C. Pavement	220,000 Sq. Yds.
3" Bituminous Concrete Shoulders	82,000 Sq. Yds.
Structure Concrete	18,000 Cu. Yds.
Reinforcing Steel	4,500,000 Lbs.
Structural Steel, Erection	2,800,000 Lbs.

Bids to be Opened January 31, 1957

Contract T-12A

Work to be done under this contract shall be commenced June 1, 1957, or on such earlier date as may be mutually agreed upon between the Commission and the Contractor. All work under this Contract shall be completed on or before July 31, 1958 and consists of:

Grading, drainage, paving, construction of appurtenances, and erection of precast concrete bridges for approximately 5.057 miles of the Northern Illinois Toll Highway, Tri-State Route.

Roadway Excavation	179,000 Cu. Yds.
Borrow	1,280,000 Cu. Yds.
Selected Subgrade	124,000 Cu. Yds.
Granular Subbase	62,000 Cu. Yds.
10" Reinforced Portland Cement Concrete	263,000 Sq. Yds.
Cast in Place Piling	14,500 Lineal Ft.
Structural Concrete	4,200 Cu. Yds.
Reinforcing Steel	805,000 Lbs.

CONTRACT T-12B

Work to be done under this Contract shall be commenced on June 1, 1957, or on such earlier date as may be mutually agreed upon between the Commission and the Contractor. All work under this Contract shall be completed on or before July 31, 1958 and consists of:

Grading, drainage, paving, construction of appurtenances, and erection of precast concrete and steel bridges for approximately 3.466 miles of the Northern Illinois State Toll Highway, Tri-State Route, in Libertyville Township, Lake Co., Ill.

Roadway Excavation	139,000 Cu. Yds.
Borrow	2,250,000 Cu. Yds.
Selected Subgrade	74,000 Cu. Yds.
Granular Subbase	43,000 Cu. Yds.
10" Reinforced Portland Cement Concrete	155,000 Sq. Yds.
Cast in Place Piling	16,725 Lineal Ft.
Structural Concrete	7,700 Cu. Yds.
Reinforcing Steel	1,133,500 Lbs.
Structural Steel, Erection	719,000 Lbs.

CONTRACT T-12C

Work to be done under this Contract shall be commenced on June 1, 1957, or on such earlier date as may be mutually agreed upon between the Commission and the Contractor. All work under this Contract shall be completed on or before July 31, 1958 and consists of:

Grading, drainage, paving, construction of appurtenances, and erection of precast concrete and steel bridges for approximately 3.678 miles of the Northern Illinois State Toll Highway, Tri-State Route in Warren Township, Lake Co., Ill.

Roadway Excavation	615,000 Cu. Yds.
Borrow	214,000 Cu. Yds.
Selected Subgrade	89,000 Cu. Yds.
Granular Subbase	51,000 Cu. Yds.
10" Reinforced Portland Cement Concrete	151,000 Sq. Yds.
Cast in Place Piling	5,000 Lineal Ft.
Structural Concrete	3,100 Cu. Yds.
Reinforcing Steel	563,600 Lbs.
Structural Steel, Erection	1,434,600 Lbs.

CONTRACT T-12ABC

Work under this Contract covers a combination of Contracts T-12A, T12B and T-12C, and consists of the work as above described for the individual Contracts, taken together.

CONTRACT N-6A

Work to be done under this Contract shall be completed in four hundred ninety-five (495) calendar days after the date specified in the Notice to Proceed, and consists of:

Grading, drainage, paving, the construction of appurtenances, and erection of precast concrete bridges for approximately 4.64 miles of the Northern Illinois Toll Highway in Construction Section N-6A thereof, in Elgin Township, Kane Co., Ill., and in Hanover Township, Cook Co., Ill.

Roadway Excavation	900,000 Cu. Yds.
Borrow	400,000 Cu. Yds.
Selected Subgrade	115,000 Cu. Yds.
Granular Subbase	65,000 Cu. Yds.
10" Reinforced PCC Pavement	197,000 Sq. Yds.
3" Bituminous Concrete Shoulders	102,000 Sq. Yds.
Structural Concrete	4,700 Cu. Yds.
Reinforcing Steel	655,000 Lbs.

Write, wire or phone for detailed information and necessary forms, Chief Engineer, Room 1654, 20 N. Wacker Dr., Chicago 6, Ill. Telephone Franklin 2-7020.

THE ILLINOIS STATE TOLL HIGHWAY COMMISSION

By Austin L. Wyman, *Chairman*

Quality Builders, 2107 Old Orchard Rd., Wilmington, Del. Separate Contracts. $600,000. 21 RESIDENTIAL DEVELOPMENT, Veale Rd., WILMINGTON, DEL. Howard Greenhouse, New Castle, Del., archt.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—The Richmond-Petersburg Turnpike Auth., 1015 E. Main St., Richmond, Zone 2,
Villa Contg. Co., Inc., 233 North Ave., Westfield, N. J. LB $2,737,964. (5 bidders). Contr. F-1-G, Sect. F, grading, drainage, paving, structures, 4.08 mi. from US Rte. 1, Dinwiddie Co. to Sycramore St., city of Petersburg, Dinwiddie Co. and City of Petersburg. Bids Jan. 3. CD 12/14.

▲ **VIRGINIA**—The Richmond-Petersburg Turnpike Auth., 1015 E. Main St., Richmond, Zone 2,
E. G. Bowles, contractor, 1506 Webster St., Richmond, Va. and **Wiley N. Jackson Co.**, P.O. Box 1408, Roanoke, VA. LB $2,735,725 (4 bidders) Contr. A-4-G, Sect. A, grading, drainage, paving, structures 2.01 mi. from vicinity of 1st and Baker Sts. to Robin Hood Rd., (excluding portion between Lombary St. and S. A. L.R. R.), Richmond City. Bids Jan 3. CD 12/14.

† **Cecil's, Inc.**, Schuyler Apartments, Spartanburg, S. C. CA $967,389, bachelor officers' quarters and air force dormitories, Seymour Johnson Air Force Base, ENG-31-075-57-19, GOLDSBORO, N. C. U. S. Eng., 308 Customhouse, Wilmington, N. C. Bids Dec. 14. CD 12/13, under LB.

▲ **FLORIDA**—State Road Dpt., Tallahassee,
Marion Constr. Co., Box 577, Ocala, Fla. CA $1,082,436. (6 bidders), limerock base with type 1 b. conc. surf. one 100 ft., one 160 ft. concrete slab bridge on precast concrete piling 14.591 mi. SR 5 (U. S. 1), F.A.F. (8) Job No. 7801-275, St. Johns Co. CD 12/19, under LB.

▲ **ALABAMA**—State Hy. Dpt., Montgomery, Zone 4.
Ala.—**B. F. Williams Constr. Co.**, Ozark, Ala. LB $402,648. Proposal "A" bit. 3.358 mi. from U.S. 84 east of Dothan to U.S. 231 south of Dothan, Houston Co.;
Ala.—**Hillabee Constr. Co., Inc.**, Alexander City, Ala. LB $202,839. Proposal "A" bit. 1.729 mi. in Alexander City toward Roanoke Roadway, Tallapoosa Co.;
Ala.—**W. S. Newell Constr. Co.**, Ashley Rd., Montgomery, Ala. LB $461,980. Proposal "A" grading, drainage 7.704 mi. from Marion N. toward Helberger, Perry Co.;
Ala.—**R. G. Brown Jr. & Co.**, Louisville, Miss. LB $330,150, grading, drainage 8.126 mi. from Eva to Florette, Morgan Co.;
Ala.—**Raley Contg. Co., Inc.**, Aberdeen, Miss. LB $181,103. grading, drainage 12.237 mi. Kennedy-Crossville Rd., Lamar Co.;
Ala.—**Robert R. Dunn Constr. Co.**, Troy, Ala. LB $88,786. base, bit. 10.25 mi. County Lake Rd., Fayette Co.;
Ala.—**G & R Coal Co.**, Decatur, Ala. LB $79,466. base, bit. 6.844 mi. road from Marshall County Line northeast via Whiton to Salme Church, DeKalb Co.;
Ala.—**Geo. A. Dozier Constr. Co.**, 4144 Wares Fy Rd., Montgomery Ala. LB $75,117. bit. 0.426 mi. Ala. 150 (14th St.) in Bessemer, Jefferson Co. Bids Dec. 21;
Ala.—cancelled bids to have been opened Dec. 21, crushing rock aggregate for use in maintenance and constr. of roads near Milltown, Chambers Co. Bids Dec. 21. CD 12/10.

BUILDINGS—LB & CA

▲ **Gailey Constr. Co.**, 1750 E. Sunrise Blvd., Fort Lauderdale, Fla. CA $1,150,000. 57 RESIDENCES S.E. 21 St. and S.E. 23 Ave., Harbor Beach, FORT LAUDERDALE, FLA. Breakwater Beach Inc., c/o Charles F. McKirahan, archt., 2400 E. Oakland Park Blvd., Fort Lauderdale. CD 12/19.

John B. Orr, Inc., 485 N.W. 54 St., Miami, Fla., CA &670,000. altering DIAL OFFICE BLDG. and addn. to TOLL OFFICE BLDG., NE 80 Terrace, west of NE 2 Ave., MIAMI, FLA. Southern Telephone & Telegraph Co., Box 390, Jacksonville, Fla. Armistead & Saggus, 739 W. Peachtree St. NE, Atlanta, Ga., archts. Lazenby & Borum & T. E. Blakely, 40 16th St. NW, Atlanta, Ga., engrs. Z. T. Crouch, c/o owner, ch. engr.

▲ **Jack Culpepper Contg.**, 114 E. 5th Ave., Tallahassee, Fla. CA $1,420,329. Tallahassee Memorial HOSPITAL addns., TALLAHASSEE, FLA., City, City Hall, Tallahassee, Fla. Bids Oct. 23. CD 11/26, under LB.

▲ **A. C. Samford, Inc.**, Slappey Dr., Albany, Ga. LB $2,729,000. rein-con. STATE OFFICE BLDG. MONTGOMERY, ALA. Albama State Bldg. Comn., State Capitol, Montgomery, Ala. CD 11/20.

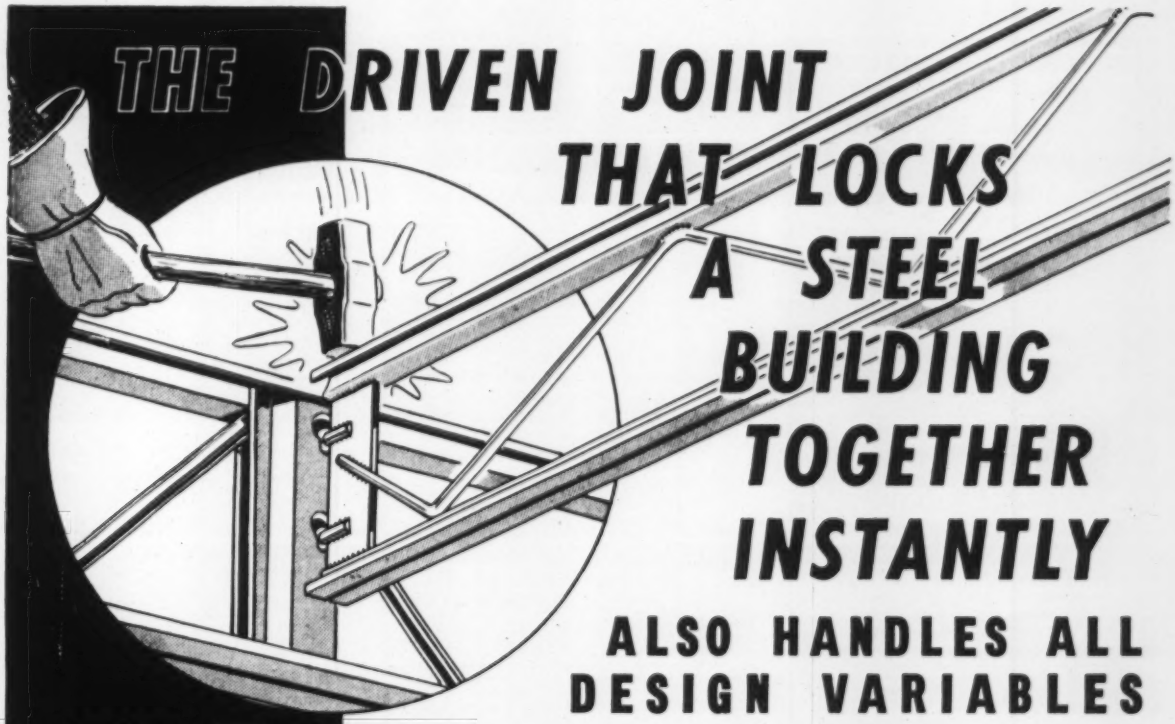
Hartz & Kirkpatrick, 25 and Frederica Sts., Ownesboro, Ky. CA $796,350. (10 bidders) three elementary SCHOOLS, Seven Hills, Newton Parish and C. Mary Lee Cravens, OWENSBORO, KY. City, School Bd., 1800 Frederica St., Owensboro, Ky. C. W. Batey, R. R. 2, Hopkinsville, Ky., engr. Bids Dec. 21. CD 12/13.

General Electric Co., River Rd., Schenectady, N. Y., CA $424,894, switching gear and associated equip. for POWER PLANT, MEMPHIS, TENN. Memphis Light, Gas & Water Comn., 2996 Hy. 61 S., Memphis, Tenn. Awarded Dec. 20. CD 8/26.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **ILLINOIS**—BA 1/24—Illinois State Toll Highway Comn., 20 N. Wacker Dr., Chicago,
DuPage Co.—Contr. E-1D, grading, draining, paving, appurts., precast concrete bridges beginning 3,600 ft. W. of State Rte. 59 ext. 3,000 ft. E. of Rte. 5,
(Continued on page 90)



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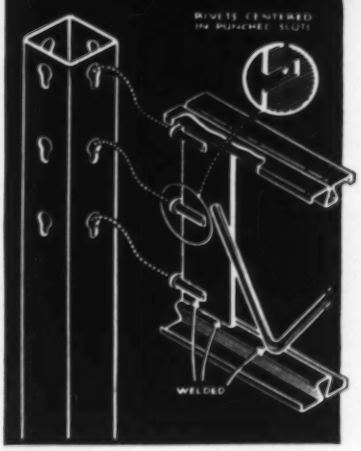
V-LOK INTERLOCKING STEEL FRAMING



THESE DESIGN VARIABLES:

1. Design Loading — Live load — 20, 30, 40 lbs. per sq. ft.
   Dead load — Roofing, Decking, Frame and Ceiling, if any.
2. Bay Size—Square or rectangle—from 20 by 20 up to 30 by 50 ft.
3. Clear Height — up to 22'.
4. Purlin Spacing — 2' to 8'.
5. Roof — Slight pitched or flat.
6. Member Depth — Equalized for ceiling attachment, etc.
7. Column Type — Round, Square or Wide Flange.

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Case History #121

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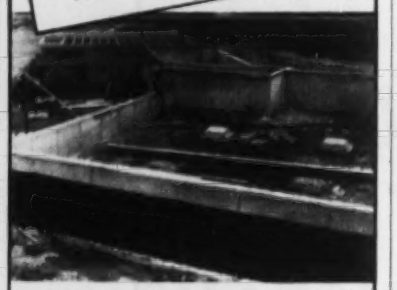

Buffalo, New York, architect, J. G. Perdy, used versatile Rocform Systems for forming the basement walls and foundation of this split level home. Picture shows a portion of the completed job with framing just beginning. Note absence of snap ties.

Contractor: United Walls, Inc., 182 Westfield, Buffalo, New York

WHY VERSATILE, COST-CUTTING ROCFORM SYSTEMS ARE *BEST* FOR *EVERY* CONCRETE FORMING JOB:

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- They automatically align walls with patented device that assures uniform wall thickness.
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DEPARTMENT EN-2

WORLD'S LEADING PRODUCER OF CONCRETE FORMS

15160 W. 8 Mile Road

Detroit 35, Michigan

(Continued from page 88)

5.67 mi., $4,000,000. Vogt, Ivers, Seaman & Assoc., 20 N. Wacker Dr., Chicago, sec. engrs.

Lake Co.—Contr. T-11A, grading, draining, paving, appurts., precast concrete bridges beginning Lake Cook Co. Rd. ext. north 3.071 mi., $5,000,000. Homer L. Chastain & Assoc., Decatur, Ill., sec. engr.

Cook Co.—Contr. T-8A, constr. 6 lane bridges, struc. 0.6 mi. beginning Franklin Ave. ext. across Chicago, Milwaukee & St. Paul R.R. yards to Mannheim Rd., $1,500,000. Hazelet & Erdal, 53 W. Jackson Blvd., Chicago, sec. engrs.

Kane Co.—Contr. N-4C, grading, draining, paving, appurts., precast concrete bridges beginning S. of village of Gilberts ext. E. 6.40 mi., $5,000,000. Caster & Stapleton & Brown & Blauvelt, Huntley, Ill., sec. engrs. CD 5/11.

O., Sandusky—BA 1/24—Comrs. Erie Co., Court House, water distr. sys., Contr. 7, constr. and paint 60,000 gal. and 100,000 gal. water tanks, $400,000; Contr. 8, Div. A, pump stations, tank foundations and valve chamber; Div. B, water lines, Homegardner Rd., Maple Ave., Bogart Rd. $400,000 in Perkins-Margaretta Sewer & Water Dist., Castalia. Plans deposit $10 each. Jones, Henry & Williams, Security Bldg., Toledo, engrs. CD 4/19.

BUILDINGS—BA

▲ **O., Kent**—LIBRARY—BA 1/28—State Dpt. P. Wks., 705 Ohio Departments Bldg., Columbus, library alteration and addn., not incl. stacks, Kent State University. $1,300,000. Plans deposit $50. Fulton, Krinsky & DelaMotte, 6014 Euclid Ave., Cleveland, Zone 3, archts. CD 2/8.

O., Columbus—LABORATORY—BA 1/29—State Dpt. P. Wks., 705 Ohio Departments Bldg., remodel and addn. to Kinnear Rd. Research Laboratory, Ohio State University. $798,600. Plans deposit $25. Wm. E. Linch, 1314 Kinnear Rd., Columbus, University archt. CD 12/20.

BUILDINGS—SLC

▲ **Ill., Arlington Heights**—SHOPPING CENTER—Farr, Chinnock & Sampson, 111 W. Washington St., Chicago, soon lets contract shopping center, sewers, water lines, paving, Kensington Rd. and Dryden Pl. $5,000,000. Mittlebusher & Tourtelot, 36 S. State St., Chicago, archts.

Ill., Chicago—Y.M.C.A. BLDG.—Young Men's Christian Assn., 19 S. La Salle St., soon lets contract 2 story, bsmnt. Y.M.C.A. bldg. addn., North Ave. at Larrabee St. $350,000. Eugene White, 19 S. La Salle St., archt. CD 9/26.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,

O.—**V. N. Holderman & Sons, Inc.**, 890 Oakland Park Ave., Columbus, O., CA **$2,118,587**, est. $2,650,000, Type T-71 and structures 5.484 mi. USR 30, Sects. 0.00, 5.79, F-1072 (1), Ashland and Richland Counties; CA **$3,164,773**, est. $3,460,000. Type T-71 and structures, 6.666 mi. USR 40, Sect. 14.81, I-529 (11), Licking Co.;

O.—**Hatcher Bros., Inc.**, 116 Schoolway, Mingo Junction O., CA **$643,583**, est. $868,200, Type T-35 on B-119 and structures 0.997 mi. SR 151, Sect. 4.91; SR 212, Sect. 0.32, S-SG-780 (2) and SG 47 (2), Harrison Co.;

O.—**J. A. Jones Constr. Co.**, P. O. Box 966, Charlotte, N. C. CA **$3,826,815**, est. $4,111,000, Type T-71 and structures 8.182 mi. USR 40, Sect. 8.67, I-529 (11), Licking Co.;

O.—**Bates & Rogers Constr. Corp.**, 600 W. Jackson Blvd., Chicago, Ill., CA **$4,055,087**, est. $4,351,000, Type T-71 and structures 0.851 mi. USR 25, Sects. (15.16) (16.73), I-1088 (1), Montgomery Co.;

O.—**D. W. Winkelman Co., Inc.**, 205 Harrison St., Syracuse, N. Y., CA **$2,262,373**, est. $2,533,000, Type T-71 and structures 4.646 mi. SR 18, Sects. 0.00, 16.23, F-U-1086 (2), Portage and Summit Counties;

O.—**Herman B. Hune**, Box 284, Marietta, O., CA **$587,-003**, est. $574,300, Type T-35 and structure 2.58 mi. SR 73, Sect. 20.78, S-492 (4), Scioto Co.;

O.—**Earl E. Sockman**, Rte. 1, Fredericktown, O., CA **$143,947**, est. $168,500, Type T-35 on B-119 and structure 0.858 mi. SR 603, Sects. (4.03-4.17), Ashland Co.;

O.—**Walter L. Follmer**, P. O. Box 173, Hamilton, O., CA **$867,643**, est. $941,600, Type T-35 on B-119 and structure 5.079 mi. USR 127, Sect. 14.82, Butler Co.;

O.—**Penker Constr. Co.**, 1030 Summer St., Cincinnati, O., CA **$3,214,364**, est. $3,548,500, Type T-71 and structures 0.776 mi. USR 50, Sect. 22.04, Hamilton Co.;

O.—**Claude A. Janes, Inc.**, Box 127, Chesterhill, O. CA **$736,000**, est. $969,500, Type T-71 and structures 3.583 mi. USR 33, Sects. (14.37-17.38), Hocking Co.;

O.—**S. E. Johnson Co.**, P. O. Box 29, Maumee, O., CA **$1,049,868**, est. $1,174,400, Type T-35 and structure 3.65 mi. USR 20, Sects (10.63-12.44), Lucas Co.;

O.—**Soda & Luscher Constr. Co. Inc.**, 1345 Warren Ave., Niles, O., CA **$519,218**, est. $483,400, Type T-35 on B-70, USR 422, Sect. 3.72, Mahoning Co. Bids Dec. 18. Grand total $23,189,261. CD 12/27, under LB.

▲ **ILLINOIS**—Illinois Toll Hy. Comn., Sherman Hotel, Chicago,

Ill.—**W. E. O'Neil Constr. Co. & Winkelman Constr. Co.**, 2751 Clybourn Ave., Chicago, Ill. LB **$5,454,553**. T-10A 6.532 mi. paving, precast concrete bridges and struc. bridges from N. of Rte. 68 to N. of Sanders Rd. Cook and Lake Counties. LB **$4,510,060**. N-7A 4.27 mi. bridges, Dupage and Cook Counties;

Ill.—**Charles Ind. Co.**, Point Ave., Rockford, Ill. LB **$1,439,817**. N-2B, 1.75 mi. near Cherry Valley, Winnebago Co.;

Ill.—**Universal Delta Co.**, Hammond, Ind., LB. **$1,332,-045**. 637,100 lin. ft. guard rail 10 to 12 ga. steel plate beam guard rail, Winnebago Co. Bids Jan. 3. CD 12/13.

▲ **Geo. D. Hardin Constr. Co.**, 2130 S. Michigan Ave., Chicago, Ill., CA **$2,500,000**. sanitary and storm sewers, BERWYN, ILL., City, City Hall, Berwyn. CD 1/5.

MICHIGAN—State Hy. Dpt., Purch. Director, 107 Lewis Cass Bldg., Lansing,

Bethlehem Steel Co., Bethlehem, Pa. LB **$434,500**. structural steel for hy. bridge on relocation of US-13 over Plaster Creek and Pennsylvania R.R. tracks, Kent Co. Bids Dec. 4. CD 11/28.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Mich.—**Bossell, Van Vechten & Chapman**, Baraboo, Wis. CA **$1,075,048**, est. $1,200,000. surf. 6.089 mi. M-95, F 52011 C1-R (SP 52-55), (F 250 13), Marquette Co.;

Mich.—**Louis Garavaglia**, 24240 Mound Rd., Center Line, Mich., and **Pierson Contg. Co.**, 200 Eddy Bldg., Saginaw, Mich. CA **$1,235,801**, est. $1,370,000. c. conc. wid'n., dual c. conc., b. conc. 6.09 mi. US-2, US-41, M-35, F 21022 C1-U (SP 21-3 (F 160-27), etc., Delta Co. CD 12/26, under LB.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Holloway Constr. Co., Livonia, Mich. CA **$2,173,416**, est. $2,550,000. c. conc. 5.221 mi., 4 bridges, BM 25031 C2-R0 (SP 25-52), etc., Genesee Co. CD 12/18, under LB.

▲ **Fruin-Colnon Contg. Co.**, 1706 Olive St., St. Louis, Mo. and **C & C Constr. Co.**, 2001 E. Pontiac St., Fort Wayne, Ind. CA **$5,160,000**, 24 m.g.d. sewage disposal plant with full treatment facilities, Warren, VAN DYKE, MICH. Warren Twp., Hildegarde M. Lowe, clk., 22720 Van Dyke Ave., Van Dyke, Mich. Bids Oct. 1, awarded Dec. 31. CD 9/28/55.

BUILDINGS—LB & CA

Ernest Alessio Constr. Co., 1745 Goodyear St., Akron, O. CA **$626,630**, (9 bidders on general constr.) West Elementary SCHOOL and Decker Elementary SCHOOL, BARBERTON, O. Bd. Educ., Barberton, O. Firestone & Motter, 1412 Cleveland St., N. W., Canton, O. archts. Awarded Dec. 26, CD 11/16/55;

Bernard Constr. Co., 90 E. Tuscarawas St., Akron, O., CA **$350,170**, general constr. East Elementary SCHOOL, (Barberton, O.).

▲ **Sam W. Emerson Co.**, 1836 Euclid Ave., Cleveland 15, O. CA Est. **$1,000,000**, 3 story, 50,000 sq. ft. SERVICE BUILDING addn., E. Hardin St. and Beech Ave., FINDLAY, O. Ohio Oil Co., 539 S. Main St., Findlay, O. Wilbur Watson Assocs., 2930 Prospect Ave., Cleveland 15, O., archts.

Don King Constr. Co., Jackson, O., CA **$565,728**, general constr. Gallia Academy HIGH SCHOOL, GALLIPOLIS, O. Bd. Educ., Gallipolis, O.

▲ **Joseph T. Carp Co.**, 5640 Northwest Hy., Chicago, Ill. CA **$5,000,000**. FACTORY, 5950 Touhy Ave., CHICAGO, ILL. York Corp., 1113 Cornelia Ave., Chicago, Ill. Friedman, Alschuler & Sincere, 223 W. Jackson Blvd., Chicago, Ill., archts.

Federal Constr. Co., 5918 N. Clark St., Chicago, Ill., CA **$450,000**, 4 story WAREHOUSE addn., Washtenaw Ave. CHICAGO, ILL. Chicago Printed String Co., 2320 W. Logan Blvd., Chicago, Ill. Bids Dec. 3. CD 12/3.

Harvey A. Hanson Bldrs., 1851 N. Elston Ave., Chicago, Ill., LB **$867,537**, 3 story Edw. Jenner Elementary SCHOOL, 1009 N. Cleveland Ave., CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St., Chicago, Ill. Bids Dec. 21. CD 12/13.

Oscar Bergquist, 134 S. Kensington St., LaGrange, Ill., LB **$439,949**, 3 story, 2 addns. to OLD PEOPLES HOME, LAGRANGE, ILL. Plymouth Place, Inc., 315 N. LaGrange Rd., LaGrange, Ill. Bids Dec. 18. CD 11/30.

Tonyan Constr. Co., 100 Borden St., McHenry, Ill., CA **$554,266**, JUNIOR HIGH SCHOOL, Park Ave., MCHENRY, ILL. School Dist. 15, McHenry, Ill. R. A. Orput, 310 Empire Bldg., Rockford, Ill., archt.

O'Brien Constr. Co., 810 S. Tripp St., Chicago, Ill., CA **$365,000**, 2 story, pt. basmnt., brick SCHOOL addn. NORTHLAKE, ILL. St. John's Parish, 52 N. Laverne St., Northlake, Ill. John Bartolomeo, 10836 S. Western Ave., Chicago, Ill., archt.

▲ **Granger Brothers**, 2702 S. Cedar St., Lansing, Mich., CA **$2,625,000**, INTRAMURAL BLDGS. for women, incl. gymnasium and swimming pool, EAST LANSING, MICH. State, A. N. Langius, dir. State Dpt., Lewis Cass Bldg., Lansing, Mich. Ralph R. Calder, 1212 Kales Bldg., Detroit, Mich., archt. Bids Dec. 19. CD 3/5.

Hungerford Constr. Co., Jackson, Mich., CA **$423,997**, Ackerson Lake and Ezra Eby SCHOOL addns., NAPOLEON, MICH. Bd. Educ., Napoleon Rural School Dist., Napoleon, Mich. Guido A. Binda & Assocs., 231 Capitol, Ave., Battle Creek, Mich., archts.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲† **Tex., San Antonio**—ACADEMIC-LABORATORY—BA 1/30—U. S. Eng., Box 1229, Galveston, flight medicine laboratory bldg., $350,000; academic bldg., $1,000,000, Brooks Air Force Base, ENG-41-243-57-15. Bid date changed. CD 12/12.

BUILDINGS—BA

▲ **Tex., Amarillo**—HIGH SCHOOL—BA 2/7—Amarillo Independent School Dist., 508 Johnson St., James W. Fannin Junior High School. $1,000,000. H. Ensign & H. Fowler and J. Chester Wright, 1312 W. 15 St., Amarillo, archts. and assocs. CD 2/29.

▲ **Mont., Great Falls**—SCHOOL—BA 2/8—School Dist., constr. Junior High School. $1,950,000. McIver, Hess & Haugsjaa, 603 Strain Bldg., archts. Bids 12/12, rejected. CD 1/3, under LB.

Minn., Duluth—SCHOOL—BA 3/21—Bd. Educ., H. F. Forsberg, clk., East Senior High School addn., alterations, 29 Ave. and Fourth St. $400,000. H. S. Starin & Assocs., 317 Sellwood Bldg., archts. CD 4/16/54.

▲ **Minn., Duluth**—SCHOOL—BA 5/1—Bd. Educ., H. F. Forsberg, clk., Woodland Junior High School, Woodland Ave. and Eighth St. $1,400,000. A. R. Melander, 603 Alworth Bldg., archt. CD 4/5.

HEAVY CONSTRUCTION—SLC

Texas—RURAL DISTRIBUTION LINES—South Plains Electric Co-operative, 615 Municipal Dr., Lubbock, soon lets contract 126 mi. 7.2 kv, 69 kv, etc. and 3 sub-stations, Lubbock, Hale, Crosby and Hockley Counties. $300,000. H. N. Roberts & Assocs., 3218 34th St., Lubbock, engrs. CD 12/3.

HEAVY CONSTRUCTION—LB & CA

Enterprise Engine & Machinery Co., 18th and Florida Sts., San Francisco, Calif., CA. **$532,474.** (3 bidders), install dual fuel diesel engine generating unit. WAVERLY, IOWA, City, Ray Hoth, city clk., Waverly, Ia. Associated Consultants, 420 Sexton Bldg., Minneappolis, Minn., engrs. Bids Dec. 17. CD 12/28, under LB.

▲† **Mississippi Valley Engineering & Constr. Co.**, 787 S. Willett St., Memphis, Tenn. CA **$1,062,525**, est. $895,790 (9 bidders) Pilot Canal excav. and dike and revetment, Little Blue to Fishing River bends, Missouri River, near Sibley, Jackson Co., Inv. 57-42, MISSOURI. U. S. Eng., Federal Office Bldg., Kansas City, Mo. Bids Dec. 18, awarded Dec. 31. CD 12/26, under LB.

▲ **Worthington Corp.**, 401 Worthington Ave., Harrison, N. J. CA **$584,886** for furnishing pumps installed ($4,311,873 cost incl. pumps and operations, incl. power over period of years). Sect. 1, high and low service pumping units incl. 10 electrically driven pumps for proposed distributive pumping station at Chain of Rocks plant of St. Louis Waterworks on Mississippi River at northern edge of city, ST. LOUIS, MO. City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 Blvd. and Market St., St. Louis 3, Mo. Bids Nov. 27, awarded Jan. 2. CD 12/10, under LB.

† **Williams Crumpecker & Sons**, Morehouse, Mo., CA. **$731,540.** 22,700 lin. ft. channel excav. for Item No. 1, Clarks Corner Cut-off along St. Francis River, St. Francis Co., CIVENG-40-041-57-59, ARKANSAS, U. S. Eng., P. O. Box 97, Memphis 1, Tenn. Bids Nov. 8. CD 11/21, under LB.

Elliott Constr. Co., Redick Tower, Omaha, Neb. CA **$642,138**, constr. 63 mi. rural distr. line from Neligh, Neb. Sub-station to Gavins Points Hydro Plant Substation, S. D., NEBRASKA-SOUTH DAKOTA. Loup River Public Power Dist., Columbus, Neb. Bids Dec. 13.

Brazoria Co., Court House, Angleton, Tex. Own Forces. **$250,000.** some road maintenance and repairing, ANGLETON, TEX. CD 9/20.

Brodie & Enix, Box 2061, Amarillo, Tex., LB **$423,449**, WW, PAMPA, TEX. City, Pampa, Tex. Roberts, Merriman & Bowden, 218 N. Russell St., Pampa, Tex. Bids Dec. 20.

BUILDINGS—LB & CA

▲† **R. D. Lowman & Co., Inc.**, Box 7155, El Paso, Tex. LB **$1,067,000.** battalion CLASSROOM BLDG. Fort Bliss, ENG-29-005-57-9, EL PASO, TEX. U. S. Eng., Box 1538, Albuquerque, N. M. Bids Dec. 20. CD 12/5.

FAR WEST

HEAVY CONSTRUCTION—BA

▲† **California**—BA 1/29—U. S. Eng., 751 S. Figueroa St., Los Angeles, flood control, Arcadia Wash, Baldwin Ave. Branch Channel (Debris Basin to Colorado St.) and Upper East Branch Channel (Orange Grove Ave. to Colorado Pl.) Sierra Madre and Arcadia, Los Angeles Co., CIVENG-04-353-57-23. $1,000,000.

† **Arizona-Utah**—BA 2/28—Bureau Reclamation, Dpt. Interior, Kanab, Utah, furnish labor and materials for Glen Canyon Dam and Powerplant, Colorado River Storage Proj., Utah-Arizona, on Colorado River in Coconino Co., Arizona, 15 mi. upstream from Lee's Ferry, Ariz., Spec. DC 4825; adv. ENR 1/17. CD 9/7.

BUILDINGS—BA

Wash., Olympia—RESIDENCE HALL—BA 1/25—St. Martin's College, Martin Way, 3 story, 30,000 sq. ft. rein.-con. men's residence hall. $450,000. Plans deposit $75 general. R. Gotteland & Assoc., 2nd & Cherry Bldg., Seattle, Zone 4, archts. CD 5/9.

Calif., Riverside—HOSPITAL—BA 1/28—Bd. Supervs., Riverside Co. Court House, 1 story rein.-con Riverside County General Hospital addn., Chronic Disease and Nurses Bldg. $650,000. Plans deposit $50. Herman O. Ruhnau, Mission Inn Rotunda, Riverside, archt. CD 4/24.

HEAVY CONSTRUCTION—LB & CA

† **Rutherford Constr. Co.**, P. O. Box 771, Albuquerque, N. M. CA **$666,163.** airmen's dormitories, Williams Air Force Base, ENG-05-353-57-27, CHANDLER, ARIZ. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. CD 11/8, under LB.

Mr. Builder..for 1 home or 10,000 THERE'S A YEOMANS LOW-COST SEWAGE TREATMENT SYSTEM

THE CAVITETTE* FOR SINGLE HOMES!
. . operates where septic tanks won't
. . absolutely no odors

Here are some of the advantages of the CAVITETTE Yeomans Home Sewage Disposer (a single-home sewage treatment system) over the septic tank system:

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4 There is no annual tank cleaning expense . . as is often the case with septic systems.
5 There is no odor . . no backup, no need for cleaning tile beds.
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. . lower cost per home
. . meets State health requirements

Here are some of the advantages of the CAVITATOR community treatment system:

1 Builders find that original cost of Cavitator community systems is up to 40% less than for individual septic tanks.
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3 Community systems improve the value of homes (both to owner and lender) . . make them easier to sell.
4 Municipalities or townships frequently are willing to assume operation of community systems because they are easy and inexpensive to run and maintain.
5 Cavitator community treatment systems produce effluent of the highest purity . . there are no objectionable odors.
6 Cavitator community systems are practical for developments of as few as 25 homes.
7 Plants are small . . can easily be camouflaged to look like a home.

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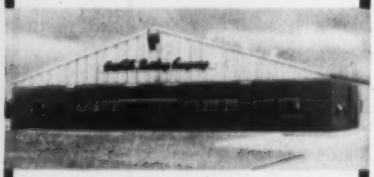

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BEHLEN Manufacturing Co.

Dept. 28A **Columbus, Nebraska**

▲ **Westinghouse Elec. Corp.,** 3 Gateway Center, East Pittsburgh, Pa. LB **$18,337,010.** furnish, erect seven 107,000 kva generators and voltage regulators for Rocky Reach power proj., Wenatchee, WASHINGTON. Chelan Co. Public Utility Dist., Wenatchee, Wash. Bids Jan. 4. CD 12/12.

▲ **CALIFORNIA**—State Dpt. P. Wks., 1120 N St., Sacramento,

Calif.—**Jesse H. Harrison,** P.O. Box 315, San Ardo, Calif. CA **$613,779.** grading, surf. 5.7 mi. new alignment of State Sign Rte. 36 from 3.2 mi. east of Tedoc Rd. to Dry Creek, Tehama Co. CD 12/31, under LB;

Calif.—**Frederickson & Watson Constr. Co. & Ransome** Co., 873 81st Ave., Oakland, Calif. CA **$3,685,555.** constr. 5.8 mi. sect. Hy. 40 freeway between Colfax and Magra, Placer Co. Bids Dec. 19. CD 12/21, under LB.

▲ **CALIFORNIA**—State Dpt. P. Wks., 1120 N St., Sacramento,

Calif.—**Gibbons & Reed Co.,** 825 W. 9th North St., Salt Lake City, Utah. CA **$4,605,488.** constr. 6.9 mi. extens. of four-lane freeway approx. 15 mi. south of Dunsmuir in Sacramento Canyon on US 99, Shasta Co.;

Calif.—**O. K. Mitory & Sons,** 1505 S. Broadway, Gardena, Calif. CA **$1,007,276.** grading, surf. initial 2 lanes, 5.2 mi. long of an ultimate 4-lane expressway on US 40 Alt. from west of Spring Garden to Sloat, Plumas Co. Bids Dec. 12, awarded Jan. 3. CD 12/17, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,

Calif.—**M. J. Ruddy & Son,** Rte. 6, Box 1419A, Modesto, Calif. LB **$258,523.** (8 bidders) paving portions approx. 8.5 mi. long, widen bridge across Steer Ditch on Sign Rte. 20 between Williams and Sacramento River at Meridian, Colusa Co.;

Calif.—**Norman I. Fadel, Inc.,** P.O. Box 306, North Hollywood, Calif. LB **$977,644.** (7 bidders) grading portions of 4-lane highway on new alignment for 3.5 mi. on US 101 and install drainage facilities, between Patricks Point State Park and 0.3 mi. north of Big Lagoon, Humboldt Co.;

Calif.—**Dicco, Inc.,** P.O. Box 217, Station A, Bakersfield, Calif. LB **$125,567.** (6 bidders) grading, surf. approx. 3.6 mi. Sign Rtes. 33/166 between 3.1 mi. east of Maricopa and 3.8 mi. west of US 99, Kern Co.;

Calif.—**Kirst Constr. Co. & Alwood Corp.,** 836 W. Woodbury Rd., Altadena, Calif. LB **$1,277,490.** (10 bidders) grading, paving 2-new lane approx. 7.9 mi. US 101 adjacent to existing traveled way between 1.8 mi. north of Salinas River bridge at King City and 1.2 mi. south of Greenfield, for 4-lane divided freeway, Monterey Co. Bids Jan. 2. CD 12/5.

▲ **CALIFORNIA**—State Dpt. P. Wks., 1120 N St., Sacramento,

Calif.—**H. Earl Parker, Inc.,** 12 and F Sts., Marysville, Calif. CA **$720,030.** grade, surf., relaignment 5.8 mi. State Sign Rte. 88 between Red Lake and 1.5 mi. east of Blue Lakes Rd., Alpine Co. CD 12/5, under LB;

Calif.—**Stolte, Inc.,** 8451 San Leandro St., Oakland, Calif. CA **$1,129,955.** grade, surface, constr. steel girder bridge, approx. 4.9 mi. State Sign Rte. 36 from 1.5 mi. east of Lassen Camp to Mineral, Tehama Co. Bids Nov. 28, awarded Jan. 3. CD 12/3, under LB.

▲† **Clyde W. Wood & Sons, Inc.,** P. O. Box 620, North Hollywood, Calif., LB **$1,041,190** (2 bidders) rehabilitate harbor facilities and constr. submerged fuel lines, Spec. 5433-56, POINT MUGU, CALIF. 11th Naval Dist., 1220 Pacific Hy., San Diego, Calif. Bids Dec. 28. CD 10/22/54.

BUILDINGS—LB & CA

C. H. Elle Constr. Co., 390 Yellowstone Ave., Pocatello, Idaho. LB **$678,400.** general contract DORMITORY and DINING HALL, POCATELLO, IDAHO, Idaho State College, Pocatello, Idaho. CD 11/13/50.

Homes of Merit, 9054 E. Garvey Blvd., San Gabriel, Calif. Owner Builds. **$511,008,** 48 stucco DWELLINGS, 10th and Locust Sts., BLOOMINGTON, CALIF.

† **B. H. Tanner,** P. O. Box 1350, Monterey, Calif., LB **$634,100** (10 bidders) rehabilitate 35 MESS HALLS, AVI 57-42, FORT ORD, CALIF. Office of Purchasing Branch, Fort Ord, Calif.

▲ **Morley Building Co.,** 7700 Sunset Blvd., Los Angeles, Calif., LB **$1,370,000** (9 bidders) Hawthorne HIGH SCHOOL addn., HAWTHORNE, CALIF. Centinela Valley Union High School Dist., 365 Hawthorne Way, Hawthorne, Calif. Bids Jan. 3. CD 12/5.

W. H. Christiansen, 18714 Parthenia St., Northridge, Calif., LB **$432,000,** est. $533,000 (6 bidders) rehabilitation and expansion of LAUNDRY. Mira Loma Detention Facility, Spec. 1726, Lancaster, LOS ANGELES, CALIF. Los Angeles Co. Bd. Supervs., 401 Hall of Records, Los Angeles, Calif. Bids Jan. 2. CD 12/12.

▲ **K & R Building Co.,** 470 S. Beverly Dr., Beverly Hills, Calif., CA **$1,434,287,** 82 stucco DWELLINGS, 139, 140 and 141 Sts., Ardath and Wilkie Aves., LOS ANGELES. Hollypark, 139th St. Co., 470 S. Beverly Dr., Beverly Hills, Calif.

Beverly Development Co., 8549 Wilshire Blvd., Beverly Hills, Calif., CA **$720,000,** 60 frame, stucco DWELLINGS, E. Fairgrove, E. Cagliero, E. Nolandale Sts., PUENTE, CALIF. Mutual Homes, Inc., 8549 Wilshire Blvd., Beverly Hills, Calif. Martin Stern, 8325 Beverly Blvd., Beverly Hills, Calif., archt.

L. A. Scherer, 2084½ Orange St., Redlands, Calif., CA **$618,800,** Dunn SCHOOL and Preston SCHOOL, admin. units, RIALTO, CALIF. Rialto School Dist., 324 N. Paom St., Rialto, Calif. Bids Dec. 20, awarded Dec. 20.

CANADA

BUILDINGS—BA

▲ **Que., Montreal**—PLANT—BA 1/22—**Canadian Bridge** Co. Ltd., 1219 Walker Rd., Walkerville, Ont., superstructure for plant, 5765 Hamilton St. $1,000,000. Percy Booth, 4795 St. Catherine St. W., archt. T. Pringle & Son, Ltd., 4795 St. Catherine St. W., engrs. CD 4/30.

Que., Montreal—PLANT and OFFICES—Bids Asked—Electric Products Co. Ltd., 6637 Jeanne Mance St., 2 story, no bsmnt., approx. 135x300 ft. structural steel frame, brick, block walls plant and offices, concrete fdns., Pare St. near CPR Yards. $500,000.

BUILDINGS—LB & CA

▲ **Foster Wheeler, Ltd.,** 1303 Yonge St., Toronto, Ont. CA **$1,500,000,** (5 bidders) REFINERY expansion program, power former unit is main item in total cost, East St. Paul, WINNIPEG, MAN. Imperial Oil Ltd., 445 S. Christina St., Sarnia, Ont. Awarded Dec. 26. CD 3/20/53.

▲ **Foundation Co. of Canada, Ltd.,** 166 Douglas St. W., Sudbury, Ont., CA **$3,500,000,** total est. $25,000,000. 100x300 ft. steel frame headframe hoist, etc. MINE EXPANSION, 3¾ mi. north of Atikokan on Canadian Natl. Rys., STEEP ROCK LAKE, ONT. Steep Rock Iron Mines Ltd., Steep Rock Lake, Ont. Watkin Samuel, 25 King St. W., Toronto, Ont., mining engr. Awarded Dec. 27. CD 7/24.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **Brazil**—Bids Asked—National Highway Dpt., Rio de Janerio, Br-14 road to connect Sao Paulo to Goiania. $10,000,000.

HEAVY CONSTRUCTION—LB & CA

▲† **NICARAGUA**—Bureau P. Rds., Dpt. Commerce, Inter-American Hy. Office, General Services Bldg., Wash. 25, D. C., U. S. A.

Nello L. Teer Co., P. O. Box 1131, Durham, N. C., U. S. A., and **Nello L. Teer Co. of Central America,** Guatemala City, Guatemala, LB **$5,225,153** (3 bidders) Proj. B-A, grading, drainage, selected borrow base, etc. from Sebaco approx. 60 mi. north of Managua and extend north for approx. 48 mi. to Condega. Bids Jan. 4. CD 11/16.

BUILDINGS—LB & CA

▲ **Fish Service de Mexico,** c/o Fish Service Corp., M & M Bldg., Houston, Tex., U. S. A. CA Est. **$3,500,000.** design and construct SULPHUR PLANT, TEXISTEPEC, MEXICO. Central Minera S. A., sub Texas Sulphur Co., Melrose Bldg., Houston, Tex., U. S. A.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Wash., Anacortes**—City, City Hall, water filtering plant, **$1,200,000.** Carey & Kramer, 1917 1 Ave., Seattle, Zone 1, consult. engrs. Bids before next summer. CD 4/21/54.

SEWERS, WASTE DISPOSAL

Calif., Merced—City, City Hall, voted bonds Dec. 18, sewers, storm drains at North Merced Trunk. **$975,000.** Paul L. Adamson, 24225 Summerhill Ave., Los Altos, consult. engr. CD 9/25.

▲ **Ill., Highland Park**—City, City Hall, sanitary and storm sewers, **$1,020,000.** Greeley & Hansen, 220 S. State St., Chicago, consult. engrs.

▲ **Ill., Park Ridge**—Mid States Development Co., 1360 N. Lake Shore Dr., Chicago, sewers, water mains paving, NW Hy.-Glenview to Main St. between Western and Dee Rd. **$1,000,000.** Nicol & Nicol, 23 E. Jackson Blvd., Chicago, engrs.

▲ **O., Toledo**—Comrs. Lucas Co., Court House, West Toledo Storm Sewer to drain approx. 4,700 acres bounded by Toledo Terminal RR, W. Bancroft St., Talmadge Rd. and Michigan line, incl. 120 main trunk and laterals from 24- to 72- in. **$3,500,000-$3,750,000.** T. C. Biebesheimer, 725 Cherry St., co. engr. CD 6/23/54.

▲ **Tex., San Angelo**—City, sewage treatment plant and 5 mi. outfall sewer. **$1,100,000.** Bids about Mar. 15. Forrest & Cotton, Praetorian Bldg., Dallas, consult. engrs.

▲ **Wash., Seattle**—City, County City Bldg., storm sewers in area bounded by 14 Ave. N.W. Fremont Ave. W. & N. 85 St. and N. & W. 143 St. **$2,000,000.** R. W. Morse, city engr. CD 8/16/54.

▲ **Wash., Seattle**—Southwest Suburban Sewer Dist., 10023 16 Ave. S.W.; sewerage sys. in Shorewood, Shoreview, Hazel Valley and Salmon Creek Dist. **$1,000,000.** Hill & Ingman, 1722 E. Madison St., consult. engrs. CD 11/18/53.

BRIDGES

▲ **Mo., St. Louis**—City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 Blvd. and Market St., Zone 3, constr. bridges and grade separation plans along Rock Island Expressway between intersection Market St. and Compton Ave. and to junction with abandoned Rock Island R. R. right of way and Millbrook Blvd. west of Skinker Blvd. **$2,900,000.** F. Ray Martin Engineers, Inc., 804 Pine St., St. Louis, Zone 1, consult. engr. CD 5/31/55.

(Continued on page 94)

▲ **N. J., Passaic**—City, City Hall, Hamilton-State St. by-pass, Gregory Ave.-River Dr. overpass and loop, Pennington Ave. and Oak St. overpasses, traffic control sys. constr. highway through Erie Railroad yard, with parking, playground and park space, $3,070,000. To go ahead in 1968.

Wash., Vancouver—City, City Hall, viaduct over freight yards at 15th and 16th Sts. $900,000.

STREETS AND ROADS

▲ **Tex., Abilene**—City, voted bonds Dec. 12, street imprvs., paving, $1,000,000.

EARTHWORK, WATERWAYS

▲ **Connecticut**—State Flood Control & Water Policy Comn., 165 Capitol Ave., Hartford, Rooster River Flood Control, widen channel, widen bridges, Bridgeport. $1,500,000.

AIRPORTS

▲† **N. Y., Rome**—AIRPORT IMPRVS.—U. S. Eng., 111 E. 16 St., New York, Zone 3, plans by Greenberg & Ames, 303 Fourth Ave., New York, Zone 10, nose wing hangar, $1,000,000-$3,000,000. Bids about Mar. 26; field maintenance shop, $100,000-$500,000. Bids about Feb. 19; central heating plant, $500,000-$1,000,000. Bids About Feb. 21; armaments and electronic shop, $100,000-$500,000, Bids about Feb. 19; auto storage bldgs., $100,000-$500,000, Bids about Feb. 19; squadron operations bldg., $100,000-$500,000, Bids about Feb. 19, all for Griffiss Air Force Base. CD 8/21/56.

▲ **Tenn., Johnson City**—RUNWAY—City of Johnson City, City Hall and Tennessee Bureau of Aeronautics, Berry Field, Nashville, acquire land and constr. and pave new instrument runway, paving, taxiway and ramp and install lights and fence, Bristol-Kingsport-Tri-City Airport. $1,379,000.

▲ **Tenn., Knoxville**—AIRPORT—City, City Hall, and Tennessee Bureau of Aeronautics, Berry Field, Nashville, general imprvs., Knoxville municipal airport. $1,319,000.

▲ **Tenn., Memphis**—AIRPORT—City Airport Comn., City Hall, city airport, incl. 2 story, 140,000 sq. ft. terminal bldg., two north-south runways and parking facilities for at least 2,400 cars. $11,360,000. Leigh Fisher & Assocs., 2225½ Riverside Dr., South Bend, Ind., consult. engrs. CD 2/13/52.

▲ **Tex., Addison**—AIRPORT—Addison Airport, Inc., c/o John D. Murchison, 1201 Main St., Dallas, executive-type airport, 400-acre tract, $1,300,000.

▲† **Tex., Bryan**—HOUSING—Purch. & Contg. Office, Bryan Air Force Base, Bryan, plans by Associated Architects & Engineers, archts.-consult. engrs. Box 1175, Abilene. 135 unit 1 story brick veneer family housing. $2,000,000. CD 8/21.

LATIN AMERICA

▲ **Argentina, Rosario**—SUBWAY SYSTEM—City of Rosario, subway system. $14,000,000. To start in 1957.

▲ **Mexico, Guadalajara**—PUBLIC MARKET—City Govt., Palacio Municipal, Guadalajara, plans public market. $1,120,000.

PUBLIC BUILDINGS

▲ **Calif., Artesia**—HIGH SCHOOL—Excelsior Union High School Dist., 17923 S. Pioneer Blvd., plans by Kistner, Wright & Wright, 1125 W. 6th St., Los Angeles, La Mirada High School, La Mirada. $2,000,000.

▲ **Calif., Fresno**—STATE OFFICE—State Div. Architecture, 1120 N St., Sacramento, state office bldg. $3,000,000. Constr. in 1957.

▲ **Calif., Los Angeles**—HEADQUARTERS—State Div. Architecture, 1100 S. Grand Ave., constr. addn. to State Div. Hys., Dist. VII Headquarters. $5,000,000. Constr. in 1957. CD 1/14/55.

▲ **Calif., Modesto**—COURT HOUSE—Stanislaus Co., Court House, plans by Mitchell Van Bourg, Hotel Claremont, Suite A, Berkeley, 2 story, bsmnt. court house, $1,500,000.

Calif., Newman—SCHOOLS—Newman Elementary School Dist., P.O. Box 545, $400,000 bond election Mar. 14, schools. $850,000.

▲ **Calif., Newman**—SCHOOL—Orestimba Union High School Dist., c/o Supt., P.O. Box 578, bond election Mar. 14, high school. $1,100,000.

▲ **Calif., Puente**—HIGH SCHOOL—Puente Union High School Dist., Puente, plans by Kistner, Wright & Wright, 1125 W. 6 St., Los Angeles, 70,000 sq. ft., frame, stucco with brick veneer Los Altos High School. $1,000,000. CD 3/7/55.

▲ **Calif., Riverside**—PHYSICAL SCIENCES—University of Calif., Riverside Campus, Riverside, plans by Bennett & Bennett, 1165 E. Colorado St., Pasadena, 2 story, 45,000 sq. ft. masonry, reinforced brick Physical Sciences Addn. No. 2. $1,243,820. CD 4/21/52.

Calif., San Francisco—CLINIC—State Div. Architecture, 1120 N St., Sacramento, 4 story Langley Porter Clinic addn. $850,000.

▲ **Colo., Colorado Springs**—SCHOOL—School Dist. No. 11, 406 N. Weber St., plans by Edward L. Bunts & F. Lamar Kelsey, and John E. Bunts, 21 E. Monument St., Senior High School. $6,900,000. CD 12/20.

▲ **Conn., Bridgeport**—HIGH SCHOOL—Town, Town Hall, Harding High School addn. $1,000,000.

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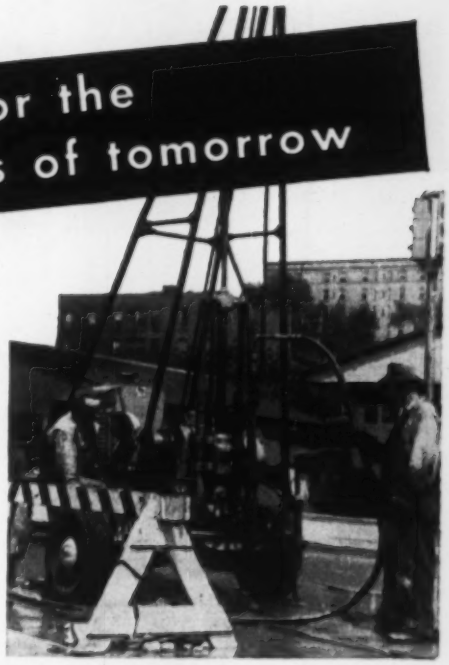

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Conn., Hamden—TREATMENT HOME—State P. Wks. Dpt., 165 Capitol Ave., Hartford, complete child study and treatment home. $700,000.

▲ **Conn., New Britain**—HOUSING—New Britain Housing Auth., 34 Merrimac Rd., plans by Kane & Fairchild, 734 Asylum Ave., Hartford, 100 unit housing, Osgood Heights. $1,210,000. John P. Legnos, 30 Gillett St., Hartford, consult. engrs. CD 6/5.

▲ **Conn., Newtown**—HIGH SCHOOL—Town, Town Hall, Junior High School. $1,000,000.

▲ **Conn., Southbury**—CHILDRENS BUILDING—State P. Wks. Dpt., 165 Capitol Ave., Hartford, mentally retarded childrens building, Southbury Training School. $2,000,000. CD 2/7/49.

▲ **Conn., Storrs**—RESEARCH ATOMIC REACTOR—State P. Wks. Dpt., 165 Capitol Ave., Hartford, research atomic reactor at University of Connecticut. $1,000,000.

▲ **Idaho, Pocatello**—STUDENT UNION—Idaho State College, Pocatello, plans by C. Allen, Pocatello, student union bldg. $1,000,000.

▲ **Indiana**—ADMINISTRATION—Indiana Toll Road Comn., 309 W. Washington St., plans by Ed. D. James, Williams & Assoc., 122 E. Michigan St., Indianapolis, administration bldg. Northern Indiana Toll Rd. $1,000,000. J. E. Greiner Co., 1106 N. Charles St., Baltimore, Md., engr. CD 3/25/55, under Streets and Roads.

▲ **Ind., Evansville**—HOSPITAL—Bd. Trustees, Deaconess Hospital, 200 bed hospital addn. $4,750,000. Work starts in summer.

Ind., Gaston—SCHOOL—Washington Twp. Trustees & Wash. Twp. Holding Co., Gaston, 1 story for wings 64x277 ft., 2 story center, 128x172 ft. school. $750,000.

† **Ind., Indianapolis**—TRAINING CENTER—General Services Admin., General Services Bldg., Wash. 25, D. C., army reserve center for 1,000 men on Kessler Blvd. north of U.S. 52. $500,000. CD 12/26.

▲ **Ind., South Bend**—UNIVERSITY—Indiana University, Admin. Bldg., Bloomington, plans by R. A. Warden & Assoc., Inc., 312 W. Colfax St., university extension center, Northside Blvd. $1,000,000.

▲† **Iowa, Ames**—LABORATORY—Dpt. Agriculture, 14 St. and Independence Ave. S. W., Wash. 25, D. C., plans by Brooks-Borg, 815 Hubbell Bldg., Des Moines, constr. animal disease laboratory, laboratory bldgs., central heating and emergency power plant, sewage decontamination plant, equip., utilities, roads. $13,000,000. Ralph M. Parsons Co., 617 S. Olive St., Los Angeles, Calif., engr. CD 9/13.

▲ **Mass., Middleton**—SCHOOL—Essex County Educational School, Bd. Trustees, Middleton, vocational school. $1,000,000.

▲ **Mass., Pittsfield**—CITY HALL—City, City Hall Bldg. Comn., City Hall, plans by Perry, Shaw, Hepburn & Dean, 31 St. James Ave., Boston, city hall, Wendell Ave. and East St. $1,000,000. Constr. in 1957. CD 3/2/44.

Mich., Ludington—SCHOOL—Bd. Educ., voted bonds Dec. 11, Junior High School addn., Elementary School. $900,000. Louis C. Kingscott & Assoc., 511 Manroe St., Kalamazoo, archts. CD 11/29.

Minn., Duluth—HEADQUARTERS—State Hy. Dpt., 1246 University Ave., St. Paul, hy. headquarters bldg. $500,000.

▲ **Minn., Stillwater**—SCHOOL—Bd. Educ., C. O. Hagen, clk., at Feb. 14 election district will vote on issuing $1,850,000 bonds for Junior High School, developing several school recreational areas, Hammel & Green, 1932½ University Ave., St. Paul, archts. CD 5/21.

▲ **Mo., Columbia**—DORMITORIES—Curators University of Missouri, Dale O. Bowling, bus. mgr., 116 Jesse Hall, Columbia, plans by Hellmuth, Obata & Kassabaum, 315 N. 10 St., St. Louis, Zone 1, three 9 story dormitories for women, 1 story, cafeteria, Kentucky Ave. and exten. of Maryland Ave., $4,500,000. To go ahead in April. CD 2/1/56.

Mo., St. Louis—CLINIC—City, Frank J. McDevitt, pres. Bd. Pub. Service, 304 City Hall, 12 Blvd. and Market St., Zone 3, plans by Leo A. Daly Co., Ambassador Bldg., 411 N. 7th St., Zone 1, clinic and parking facilities for Homer G. Phillips City Hospital in area bounded by Goode Ave., Whittier and North Market Sts. and St. Ferdinand Ave. $850,000. Milligan & Miklas Consulting Engineers, Ambassador Bldg., 411 N. 7th St., Zone 1, struct. engrs. Belt & Given, 103 E. Jefferson St., Kirkwood, Zone 22, mech. and elec. engrs. CD 2/18/55.

▲ **Mo., Springfield**—FINE ARTS, etc.—Southwest State College, Springfield, plans by A. C. Easterley, McDaniel Bldg., Springfield, fine arts bldg., $875,000; plans by H. A. Casey & Assoc., 817 St. Louis St., two women's dormitories, men's dormitory, $1,300,000; plans by R. P. Stahl, 530 S. National St., classroom bldg., $650,000, bids in Feb. 1957; practical arts bldg., $350,000. Bids in May or June. CD 3/26.

▲ **Mont., Butte**—HOSPITAL—Silver Bow Co., Court House, plans by Norman J. Hamill, 122 W. Granite St., Butte, county hospital, $2,000,000. CD 11/12.

▲ **Mont., Butte**—SCHOOLS—Silver Bow County School Dist. No. 1, Butte, two new elementary schools, alterations to 9 existing schools, considering new Junior High School. $2,000,000.

▲ **N. H., Durham**—LABORATORY—University of New Hampshire, Durham, plans by Perry, Shaw, Hepburn & Dean, 31 St. James Ave., Boston, Mass., science laboratory. $1,000,000.

▲ **N. J., Burlington**—SCHOOL—Archdiocese of Camden, 721 Cooper St., Camden, and Parish of St. Paul, Burlington, school, 15 acre tract, second to 7th Sts. $1,500,000.

▲ **N. J., Ewing Twp. (P. O. Trenton)**—SCHOOL—Bd. Educ., Ewing Twp., school to replace the Lanning School. $1,500,000.

▲ **N. J., Medford**—SCHOOL—Bd. Educ., Lenape Regional High School Dist., high school, Church and Hartford Rds. $2,100,000.

N. Y., Fulton—SCHOOL—Fulton Bd. Educ., voted $830,000 bonds Dec. 1, James E. Lanihan Elementary School. CD 9/14.

▲ **N. Y., New York**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, plans by Simeon Heller, 38-11 Union St., Flushing, alterations to Grace H. Dodge Vocational High School, 701 St. Ann's Ave. $1,325,000.

▲ **N. Y., Rotterdam**—SCHOOL—Town plans by Warren H. Ashley, 967 Farmington Ave., West Hartford, Conn., Junior-Senior High School, $2,700,000, Marchant & Minges, 1007 Farmington Ave., West Hartford, Conn., consult. engrs.; site preparation for Rotterdam Junior-Senior High School, $200,000, Chas A. Currier & Assoc., 967 Farmington Ave., West Hartford, Conn., consult. engrs.

▲ **O., Toledo**—SCHOOLS Bd. Educ., Southard Ave., two high schools, one in South Toledo at Glazaman Rd. and Detroit Ave. and the other in West Toledo, $6,000,000. CD 11/23/49.

▲ **Pa., Hershey**—SCHOOL—General State Auth., 18 and Herr Sts., Harrisburg, plans by E. G. Good, Jr., 904 N. Second St., Harrisburg, training school for Pennsylvania State Police, $1,200,000. A. F. Jones, c/o owner, ch. engr. CD 3/1/56.

▲ **Pa., Newtown**—SCHOOL—Council Rock Joint School Dist., Newtown, plans by Heacock & Platt, 1505 Race St., Phila., high school addn. $1,500,000. Allabach & Renis, 16 S. Broad St., Phila., consult. engrs. CD 1/4.

Pa., Polk — KITCHEN AND DINING ROOM — General State Auth., 18 and Herr Sts., Harrisburg, plans by Trefry Engineering Co., Box 230, Butler, kitchen and dining room facilities at Polk State School. $880,000. A. F. Jones, c/o owner, ch. engr. CD 9/28.

▲ **Pa., Schwenksville**—SCHOOLS—Schwenksville Area Joint School Auth., plans by John S. Carver, 2112 Spruce St., Phila., Junior Senior High School, alterations to present bldg., $1,000,000; elementary school, $344,000, Robert McLaughlin, 1411 Walnut St., Phila., consult. engrs. CD 11/9.

▲† **Tenn., Knoxville**—OFFICE—Tennessee Valley Auth., New Sprankle Bldg., office. $3,000,000. No appropriation.

▲ **Tex., LaPorte**—HIGH SCHOOL—LaPorte Independent School Dist., LaPorte, plans by Matt E. Howard, Jr., 2444 Times Blvd., Houston, high school plant. $1,500,000.

▲ **Tex., Odessa**—SCHOOLS—Ector Co. Independent School Dist., c/o Dr. Kirk, supt., Odessa, defeated bonds Dec. 15, school imprvs., incl. new high school, elementary school, addns. to existing schools, $4,000,000, Wilson, Patterson & Assocs., 601 Bailey St., Fort Worth, archts. CD 12/27.

▲ **Utah, Salt Lake City**—SCHOOL—Granite School Dist., David Gurley, supt., 3212 S. State St., $3,200,000 bond election Feb. 5, school.

▲ **Utah, Salt Lake City**—THEATRE REPLICA—Utah State Building Bd., 419 State Capitol Bldg., Salt Lake City, Old Salt Lake Theatre replica, on University campus, $1,000,000.

▲ **Utah, Sandy**—HIGH SCHOOL—Jordan School Dist., Reed H. Backstead, supt., 9361 S. State St., plans by Ashton, Evans & Bazier, 24 S. W. Temple St., Salt Lake City, Jordan High School addn. $2,000,000.

Wash., Port Angeles—SCHOOL—School Dist. 17, $625,000 bond election Feb. 19, high school addn. $731,000.

▲ **Wash., Seattle**—SCHOOLS—School Dist. No. 1, 415 4 Ave. N., plans by Jones & Bindon, Hoge Bldg., Zone 4, Harrison Elementary School addn. $500,000; plans by P. Thiry, 800 Columbia St., Cedar Park Elementary School 35 Ave. N. E. and E. 135 St., $625,000; plans by Waldron & Dietz, 1411 4th Ave. Bldg., Zone 1, Sacajawea Elementary School, 20 Ave. N. E. and E. 95 St., $625,000; plans by G. W. Stoddard, 1120 Harvard Ave., Zone 2, Sand Point Elementary School, 60 Ave. N. E. and E. 63 St., $625,000; and Arbor Heights Elementary School addn. $400,000. CD 11/9.

Wash., Spanaway—SCHOOL—Bethel School Dist., Spanaway, plans by Botesch & Brown, Commerce Bldg., Everett Junior High School. $900,000. Bids in 1957. CD 11/14.

▲ **Wis., Madison**—DORMITORIES—University of Wis., Madison, plans by Mittelbusher & Tourtelot, 36 S. State St., Chicago, Ill., two 4 story, bsmnt., 48,000 sq. ft. rein.-con., brick, blocks, 2 mens dormitories, $2,000,000. CD 4/19.

▲ **Alta., Calgary** — CANCER CLINIC — Dpt. P. Wks., Parliament Bldgs., Edmonton, 2 story, bsmnt. cancer clinic to Holy Cross Hospital. $1,000,000.

B. C., Kamloops—SCHOOL—School Dist. 24, Kamloops, rate payers Dec. 15, passed money bylaw, school constr. $1,573,000.

▲ **B. C., Kitimat**—SCHOOLS—School Dist. 80, Kitimat, ratepayers on Dec. 15, approved referendum schools. $2,350,000. Program for 1957 and 1958.

▲ **B. C., Richmond**—SCHOOL—School Dist. 48, Richmond ratepayers, Dec. 15, passed money bylaw, schools. $2,400,000.

▲ **Man., Winnipeg**—FEDERAL—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., plans by Moody & Moore, 295 Broadway Ave., federal bldg., York and Kennedy Sts.

to house Income Tax Department. $1,000,000. CD 8/29/46.

▲ **Ont., Toronto**—SCHOOLS—Bd. Educ., 155 College St., Ryerson Public School, 677 Dundas St., W., $989,100. Bids 1957; Junior School, 541 Huron Ave., $541,500.

▲ **Ont., Toronto**—SCHOOL—North York Bd. Educ., 7 Kenneth St., Willowdale, Toronto, Highland Hill Junior High School. $1,139,250. CD 11/9/55.

Ont., Toronto—SCHOOL—Toronto Bd. Educ., 155 College St., 11,000 sq. ft. Parkdale Public School addn. $561,085. Bids in 1957. CD 12/15/43.

Que., Seven Islands—PUBLIC BLDG.—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., plans by Adrien Dufresne, 505 Royale St., Beauport, 2 story, bsmnt., 80x125 ft. public bldg., Brochu and Napoleon Sts. $500,000.

COMMERCIAL BUILDINGS

▲ **Ala., Tuskegee**—DORMITORIES—Tuskegee Institute, Tuskegee, 4 dormitories, $2,000,000.

▲ **Ariz., Tucson**—HOUSES—Sueno Casas, Inc., 27th St. and Alvernon Rd., 638 houses. $6,000,000.

▲ **Ark., Fort Chaffee**—HOUSING—U. S. Eng., P. O. Box 867, Little Rock, 215 units Capehart House, $3,000,000. Bids in April-May.

▲ **Calif., Beverly Hills**—OFFICE—Reddi-Wip, Inc., 8025 Melrose Ave., Los Angeles, plans by Welton Becket & Assoc., 5657 Wilshire Blvd., Los Angeles, Calif. office, Wilshire Blvd. and LeDoux Rd. $2,000,000.

Calif., Lucerne—DWELLINGS—Hesperia Sales Corp., 1111 W. Foothill Blvd., Azusa, plans by Campbell & Miller, 455 4th St., San Bernardino, dwellings, Tr. 5528. $620,000.

▲ **Calif., Palo Alto**—LABORATORY—Bd. Trustees Stanford University, Palo Alto, plans by Gardner Dailey, 442 Post St., San Francisco, electronic laboratory, physics bldg. addn. and 5 other bldgs. for science and research. $10,000,000.

▲ **Calif., Palo Alto**—BOILER PLANT, etc.—Stanford University, Palo Alto, plans by Spencer & Ambrose, 251 Kearny St., San Francisco, steel, concrete boiler plant and heating sys. for campus. $1,300,000. G. M. Simonson, 507 Howard St., San Francisco, consult. engr.

▲ **Calif., San Francisco**—HOTEL, etc.—Jack Tar Hotels, Charles A. Sammons, 6 St. and Blvd., Galveston, Tex., plans by Thomas M. Price, 1227 L St., Galveston, Tex., and Hertzka & Knowles, 85 Post St., San Francisco, 4 story hotel, 9 story office bldg. with underground garage. $10,000,000. Graham & Hayes, 417 Market St., San Francisco, Calif., structural engrs.

▲ **Conn., Danbury**—SHOPPING PLAZA—Mount Pleasant Corp., 34 Pleasant St., plans by Philip N. Sunderland, Inc., 81 West St., Danbury Shopping Plaza, North St. $2,000,000.

▲ **Conn., Hamden**—HOUSES—Mauro Constr. Co., 62 Bassett St., New Haven, 172 houses, Forest Hills, Old Hartford Turnpike. $1,720,000.

▲ **Conn., Hartford**—CHURCH—Archdiocese of Hartford, 140 Farmington Ave., rebuild St. Joseph's R.C. Cathedral. $5,000,000.

▲ **Conn., Hartford**—HOSPITAL—St. Francis Hospital, 114 Woodland St., plans by York & Sawyer, 101 Park Ave., New York, N. Y., hospital wing. $3,000,000, Jansen & Rogan, 500 Fifth Ave., New York, N. Y., consult. engrs. CD 12/12.

Conn., Hartford—CHURCH—St. Patrick's R. C. Church, 295 Church St., rebuild church. $500,000.

▲ **Conn., New Haven**—APARTMENT—City, New Haven, construct and finance, 700 unit apartment, part of Oak St. area Redevelopment. $7,000,000. Wm. Bolton, city engr.

Conn., New Haven—SHOPPING CENTER—Owner, c/o Charles Brown, 24 Temple St., shopping center, Congress Ave. $700,000.

▲ **Conn., New Haven**—COMMERCIAL—Syndicate, c/o New Haven Redevelopment Agency, Hall of Records, 200 Orange St., 2 story commercial bldg., College St. Exten. $650,000; 2 story commercial bldg., College St. exten., $625,000.

Conn., West Hartford—SHOPPING CENTER—Morton Realty Co., 326 N. Main St., 2 story, 60,000 sq. ft. shopping center, parking area for 675 vehicles, North Main St., Bishop's Corner. $660,000.

▲ **D. C., Wash.**—HOUSING—U. S. Eng., 1st. and Douglas Sts. N.W., Zone 55, plans by Mills, Petticord & Mills, 3308 14th St. N.W., 120 unit Capehart Housing, Wash., D. C., Defense Area. $1,000,000-$3,000,000.

▲ **Fla., Vero Beach**—RESIDENTIAL COMMUNITY—St. Francis Corp., Vero Beach, residential community, Indiana River Shores, $200,000,000. Page S. Hopkins, c/o Maddox & Hopkins, 8506 Dixon Ave., Silver Spring, Md., consult. engr. and surveyor.

▲ **Ill., Chicago**—HOTEL, etc.—Drake Hotel, E. Lake Shore Dr. and N. Michigan Ave., plans by Walton & Walton, 626 Grove St., Evanston, hotel and motor court apartments, E. O'Hare Field between NW Highway and Ill. Toll Rd. $4,000,000.

▲ **Ill., Chicago**—APARTMENT—Al Robins, c/o Robin Constr. Co., 1333 N. Wells St., plans by Bernard Krauss, 300 W. Washington Blvd., 5 story, 256 unit brick apartment, Damen and Granville Aves. $3,000,000.

▲ **Ill., Chicago**—APARTMENT, etc.—Leo Soloman, 3127 N. Sheridan Rd., 24 story, 400 unit brick apartment and garage, 6301 N. Sheridan Rd. $5,800,000.

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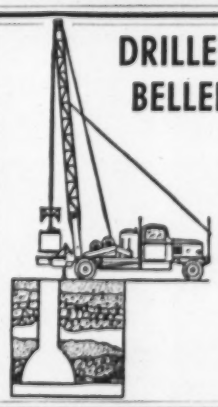

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▲ **Kan., Winfield**—DORMITORY—Southwestern College, Winfield, plans by Buck Assoc., Bartlesville, Okla., women's dormitory, men's dormitory, apartments for married students, student center. $1,300,000.

▲ **La., Bossier City**—MOTEL—Ben Beckham, 1045 Erie St., Shreveport, motel, Old Minden Rd. and U. S. Hy. 80. $1,450,000.

▲ **Me., Presque Isle**—HOSPITAL—Presque Isle General Hospital, Second St., plans by The Architects Collaborative, 63 Brattle St., Cambridge, Mass., and Kenneth E. Jackson, superv. archt., 46 Third St., Presque Isle, Me., hospital, off Academy St. $1,200,000. CD 4/26.

Miss., Laurel—POST OFFICE—General Services Admin., Pub. Bldgs. Service, General Services Bldg., 19 and F Sts. N.W., Wash. 25, D. C., plans by William I. Rosamond & Associates, archts.-engrs., Propst Bldg., Columbus, lease-purchase, post office. $829,000.

▲ **Mo., St. Louis**—COMMERCIAL—The Fleischer Co., M. I. Fleischer, pres., 4900 Washington Blvd., St. Louis, Zone 8, 1 story, 100,000 sq. ft. commercial bldg. on 240x500 ft. site at Manchester and Dale Aves., between Sublette and Pierce Aves. $1,000,000.

▲ **Neb., Omaha**—SHOPPING CENTER—George W. Eckles, 2235 St. Marys St., Omaha, Neb., plans by R. A. Teig & E. J. Sessinghaus, Karbach Bldg., Omaha, Pacific Plaza Shopping Center, 118 and Pacific St. $3,500,000.

▲ **Neb., Omaha**—OFFICE—Owner, c/o L. A. Daly Co., archt., Insurance Bldg., 10 story office, near 35 and Farnam St. $1,000,000.

▲ **O., Cincinnati**—DORMITORY—University of Cincinnati, Burnet Woods Park, Cincinnati, plans by Potter, Tyler, Martin & Roth, 128 E. 6 St., Cincinnati, men's dormitory addn. $1,800,000. plans by Cyrus Baxter & Assoc., Oak St., Mariemont, teachers college, botany-zoology bldg. addns., physics bldg. addn. $1,600,000. Hixon-Tarter & Assoc., 2306 Park Ave., Cincinnati and O. W. Motz, 920 E. McMillan St., Cincinnati, consult. engrs. latter project.

▲ **O., Lima**—HOSPITAL—St. Rita's Hospital, 801 W. High St., 7 story, concrete, brick, hospital addn. $2,000,000.

▲ **O., Youngstown**—HOSPITAL—Bd. Trustees, Youngstown Hospital Assn., Wm. Hitchcock, pres., North Side Gypsy Lane and Goleta Ave., 4 story addn., north wing, $1,402,500; 1 story U-shaped school addn., Gypsy Lane to North Side Hospital and Nursing School. $537,500. Bids in April or May 1957.

▲ **O., Youngstown**—SCIENCE—Youngstown University, Dr. Howard W. Jones, pres., 410 Wick St., plans by Kling & Frost, 661 W. Wick Ave., 3 story, bsmnt. science bldg. $1,000,000. Work to start in 1957. CD 3/28.

▲ **Pa., Phoenixville**—SUPERMARKET, etc.—Great Atlantic & Pacific Tea Co., 32 and Chestnut Sts., Phila., supermarket and stores, $1,000,000.

Pa., Pittsburgh—SCHOOL—Pittsburgh Catholic Diocese, 125 N. Craig St., plans by Celli-Flynn, 335 Shaw Ave., McKeesport, 2 story, 205x225 ft., brick, steel parochial high school, Fallowfield Twp., North Charleroi, $750,000.

▲ **R. I., Middletown**—SHOPPING CENTER—Kempenaci Real Estate Co., c/o William O'Rourke, 90 Union St., Warren, shopping center, East Main Rd., and parking area. $1,000,000. Construction in 1957.

▲ **Tex., Dallas**—HOTEL-OFFICE—Midwestern Security Life Insurance Co., 308 S. Harwood St., hotel-office, Mokingbird Lane, near Love Field. $5,000,000.

Tex., Houston—DWELLINGS—Freeway Development Co., Inc., 5519 Lawndale St., 50 dwellings, new sect. Freeway Manor. $625,000.

Tex., Houston—MOTELS—National Motels, c/o Allen Fields, Owner, 5311 Jensen St., plans by I. J. Castles, 20 N. Sampson St., Motel No. 5, Telephone Rd., near National Airport, $500,000; Motel No. 6, Katy Rd., $400,000.

▲ **Wash., Spokane**—CONVENT—Sisters of Charity, Mount St. Joseph Provencial, W 14 9th St., 5 story convent. $1,500,000.

W. Va., Mount Hope—OFFICE—General Services Admin., General Services Bldg., Wash., D. C., plans by Glenn C. Hancock, Security Bldg., Charleston, lease-purchase office for Bureau of Mines. $700,000.

Wis., Eau Claire—HOSPITAL—Luther Hospital, 310 Chestnut S., plans by Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago, Ill. 2 story, bsmnt., rein.-con., brick, stone hospital addn. $700,000.

▲ **Que., Montreal**—SCHOOL—External Classique Ste. Croix, 3820 Sherbrooke St. E., school addn. Sherbrooke St., between Nicolet and Valois Sts. $1,250,000.

▲ **Que., Montreal**—OFFICE and APARTMENT—McCaulay Realties & Co., 330 Victoria Ave., office and apartment. $1,000,000.

INDUSTRIAL BUILDINGS

▲ **Calif., Bartlett**—PLANT MODERNIZATION, etc.—Columbia-Southern Chemical Corp., Bartlett, plant modernization and expansion of old buildings and machinery. $1,000,000.

▲ **Calif., Boulder Creek**—ELECTRONIC PLANT—Lockheed Aircraft Corp., 2555 N. Hollywood Way, Burbank, electronic plant, west of here. $1,500,000.

▲ **Ill., Cicero**—HAWTHORNE WORKS—Western Electric Co., 26th and Cicero Sts., 1 story, 250,000 sq. ft. brick Hawthorne Works addn. $4,000,000.

▲ **N. J., New Market**—PLANT—Union Steel Corp., 2150 Stanley Terrace, Union, plans by Stephen Potter, 410 Colonial Ave., Union, expansion of plant for manufacturing welded stainless steel pipe and tubing. $9,000,000.

▲ **O., Cleveland**—PLANT—American MonoRail Co., 13107 Athen Ave., Lakewood, Zone 7, plans by Ward & Conrad, Hanna Bldg., Zone 15, 76,000 sq. ft. plant addn., 2 story office sect., W. 150 St. and Brookpark Rd. $1,000,000. Bids middle of 1957.

▲ **O., Dayton**—FACTORY—National Cash Register Co., S. C. Allyn, pres., S. Main and "K" Sts., 4 story, 150,000 sq. ft. factory, S. Main St., to house woodworking operations. $1,600,000. CD 1/6/55.

▲ **O., Springfield**—PLANT—Steel Products Engineering Div., Kelsey-Hayes Wheel Co., 1205 W. Columbia St., 100,000 sq. ft. plant, 68 acre site, north of here. $1,000,000. Bids in spring.

Pa., York—FACTORY—Standard Register Co., M. A. Spayd, pres., 626 Albany St., Dayton, O., 64,000 sq. ft. factory addn. to present plant, $600,000. To start by Mar. 1.

▲ **Tex., Bonham**—PLANT—General Wire & Cable Corp. (Alpha Duct Wire & Cable Div.) 420 Lexington Ave., New York, N. Y., 90,000 sq. ft. concrete plant, 23-acre site. $1,000,000.

Tex., Galveston—PLANT—Falstaff Brewing Corp., 3617 Olive St., St. Louis 8, Mo., plans by O. W. Stiegemeyer, 3 Sharaton Dr., St. Louis 24, Mo., beer bottling plant. $750,000. Bids March 1957. CD 8/3.

Tex., Houston—PLANT EXPANSION—Armco Drainage & Metal Products, Inc. (subsidiary of Armco Steel Corp.) C & I Life Bldg., plant expansion. $700,000.

▲ **Tex., Houston**—BREWERY—Lucy Lager Brewing Co., 2601 Newhall St., San Francisco, Calif., brewery, 37-acre site in Highland Industrial Dist., Hempstead Rd. $3,000,000. Wahl-Henis Institute, 1135 W. Fullerton St., Chicago, Ill., consult. engr.

▲ **Tex., Houston**—PLANT—Oak Farms Dairies, 1114 N. Lancaster St., Dallas, plans by Golemon & Rolfe, 5100 Travis St., dairy plant, 8.6 acre site, Gulf Freeway. $1,000,000. Barnard Johnson & Assocs., 4926 Travis St., consult. engrs.

Tex., White Deer—REFINERY UNIT—Dorchester Corp., White Deer, uniformer-catformer unit to existing gasoline refinery. $750,000. Grebe & Doremus Process Co., 4601 Stanford St., Houston, consult. engr.

▲ **Wash., Seattle**—PLANT—Bethlehem Pacific Coast Steel Corp., 3631 E. Marginal Way, expansion and modernization of steel plant, incl. 100-ton capacity electric furnaces. $25,000,000. Work to begin early in 1957.

▲ **Ont., Burlington**—PARTS DEPOT—International Harvester Co. of Canada Ltd., 200 Hillyard Ave., Hamilton, plans by Kyles & Kyles, 247 John St. S., Hamilton, 215,000 sq. ft. parts depot, southeast corner of Cloverleaf intersection of Queen Elizabeth Way and Hy. 401, $1,500,000. Bids in January.

Ont., Toronto—WAREHOUSE—Ford Motor Co. of Canada, Ltd., 120 Bloor St. E., 100,000 sq. ft. warehouse, 41-acre site, south of Sheppard Ave. W. near Hy. 400. $750,000.

▲ **Que., Montreal**—PARKING GARAGE—Pierre Pouliot & Emile Collet, c/o C. H. Copeman, archt., 1117 St. Catherine St. W., 10 story, 100x112 ft. parking garage (automatic) near Mansfield and Burnside. $1,000,000. Truscon Steel Co., 1117 St. Catherine St. W., structural engr. CD 12/31.

▲ **Que., Montreal**—PLANT—Gatusso Corp., Ltd., 5205 Cote deLiesse Rd., plans by Patsy Colangelo, 8759 St. Lawrence Blvd., 1 story, steel, brick plant extens. $2,000,000.

UNCLASSIFIED

▲ **Calif., Santa Barbara**—FAIR GROUND BUILDINGS—State Div. Architecture, 1100 S. Grand Ave., Los Angeles, exhibit and administration bldg., $800,000; horse barns, related facilities, $700,000, at 19th District Agricultural Association Fairground. Constr. in 1957.

▲ **Calif., Stockton**—GRANDSTAND, etc.—State Div. Architecture, 1120 N St., Sacramento, constr. new grandstand, $600,000; horse barns and related facilities, $600,000, at 2nd District Agricultural Assn. Fairground. Constr. in 1957.

Mich., Ann Arbor—PARK and RECREATION FACILITIES—City, Fred J. Looker, clk., bond election Feb. 18, park and recreation facilities, $500,000; outdoor swimming pool, Veterans Memorial Park, $300,000. George H. Sandenburgh, city engr.

▲ **North Carolina**—RURAL DISTRIBUTION LINES—Brunswick Electric Membership Corp., Shallotte, 200 mi. rural distr. lines, 18 mi. 69 kv transmission line and sys. imprvs., Brunswick Co. $1,525,000. CD 4/28/50.

▲ **South Carolina**—RURAL DISTRIBUTION LINES—Black River Electric Co-operative, Sumter, 120 mi. rural distr. lines and sys. imprvs., Sumter Co. $1,150,000. CD 1/28/52.

▲ **Texas, Colorado, Utah, New Mexico, Arizona**—PIPE LINE—El Paso Natural Gas Co., Bassett Tower, El Paso, Tex. laying 80 mi. 8 in. and 300 mi. 10 in. crude and products lines, Utah, $9,500,000; 170 mi. microwave radio relay link to sys. between Flagstaff, Ariz. and Gallup, N. M., Gallup Terminal, Arizona-New Mexico, $200,000; 11 mi. 4 in. L.P.G. products line, terminal at Andrews, Tex., $75,000; 29 mi. 18 in. gas pipe line between Dumas and Panoma Plant, Dumas, Tex., $550,000. CD 2/5/53.

▲ **Texas**—GAS LINE—Permian Basin Pipe Line Co., 2223 Dodge St., Omaha, Neb., 83 mi. 16 in. gas line, Spraberry Station in Midland Co. to near Eldorado, Schleicher Co. $1,660,000; gas compressor station, near Eldorado, Schleicher Co. $750,000.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 28 Connecticut
STREETS AND ROADS
January 22 Massachusetts January 28 Connecticut

BUILDINGS—BA

▲ **Mass., Peabody**—DEPARTMENT STORE—BA 2/14—Allied Storage Lines, Junction Andover St. (Rte. 114) and Rte. 128, department store and shopping center, North Shore Shopping Center, Rtes. 114 and 128, $3,500,000. John Graham & Co., 444 Fifth Ave., New York, N. Y., archts. Jordan-Marsh Co., Boston, Mass., lessee.

BUILDINGS—LB & CA

Harvey Constr. Co., Inc., 450 Valley St., Manchester, N. H., CA $984,000, LIBRARY, DURHAM, N. H. University of New Hampshire, Durham, N. H. Bids Nov. 28. CD 12/4, under LB.

▲† **Gramercy Constr. Corp.**, 114 Liberty St., New York, N. Y., CA $595,882, Medical Research LABORATORY, U. S. Naval Submarine Base, IFB NBy 3950, NEW LONDON, CONN. Dist. P. Wks. Office, Third Naval Dist., 90 Church St., New York 7, N. Y. Bids Dec. 13. CD 11/30.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
January 29 Maryland

BUILDINGS—BA

▲† **New Jersey**—HOUSING—BA On Or About 1/31—U. S. Eng., 111 E. 16 St., New York 3, N. Y., family housing, Special AAA Facilities, 12 units, Crawford Corners, $200,000-$300,000; 12 units, South Amboy, $200,000-$300,000; 24 units, Ramsey, $400,000-$500,000. ENG-30-075-57-294. Plans deposit $25. CD 10/12, under Unclassified.

† **New York**—HOUSING—BA On Or About 1/31—U. S. Eng., 111 E. 16 St., New York, Zone 3, family housing, Special AAA Facilities, 36 units, Orangeburg, $500,000-$600,000; 12 units, Spring Valley, $200,000-$300,000. ENG-30-075-57-294. Plans deposit $25. CD 10/16.

▲ **Md., Fort George G. Meade**—HOUSING—BA 2/5—U. S. Eng., 24 St. and Maryland Ave., Baltimore, Zone 18, construct and finance armed services housing, 1,000 units, (Capehart), ENG-18-020-57-21. $14,000,000. Plans deposit $100. McGaughan & Johnson, 2000 P St. N.W., Wash. 6, D. C., archts.-engrs. CD 12/10, under LB.

▲ **N. Y., Cheektowaga**—WAREHOUSE—Bids Asked—Loblaw, Inc., 678 Bailey Ave., Buffalo, 312,000 sq. ft. warehouse and truck facility at Genesee St. and Buell St., opposite Buffalo Airport, $2,500,000. Stanley C. Podd, 361 Delaware Ave., Buffalo, archt. CD 5/16.

HEAVY CONSTRUCTION—LB & CA

▲ **Manhattan Water Works, Inc.**, 318 Randall Ave., New York 59, N. Y. CA $1,574,590. Contr. No. 195, combined relief sewer, NEW YORK, N. Y. President Manhattan Boro, Municipal Bldg., New York 7, N. Y. CD 10/1, under LB.

▲ **Garofano Constr. Co. & Garquist Constr. Co.**, (joint venture), 2 Gramatan Ave., Mount Vernon, N. Y. LB $1,077,500 (2 bidders) general constr. new ferry slip and terminal bldg. and installation ferry facilities equip. and services near foot of E. 134 St., East River, Bronx Boro, NEW YORK, N. Y. Comr. of Marine & Aviation, Pier 1, North River, New York 4, N. Y. Bids Jan. 9. CD 12/10.

Watson Flagg Eng. Co., 140 Cedar St., New York 6, N. Y. LB $962,318 (A) $982,718 (B) $974,558 (C) (5 bidders) replacing of contact rail Lenox-White Plains Rd. Line, E. 180 St. to Gun Hill Rd. I.R.T. Div., Contr. T-127, NEW YORK, N. Y. New York City Transit Auth. 370 Jay St., Brooklyn 1, N. Y. Bids Jan. 4. CD 12/18.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,

N. J.—**Franklin Contg. Co., Inc.**, 12 Central Ave., Newark, N. J., LB $902,946. Rte. 208 viaduct over proposed Main St. relocated Diamond Creek, Erie R.R. main line, and Boulevard in borough of Glen Rock, Bergen Co.

N. J.—**Public Constructor, Inc.**, P.O. Box 247, Gloucester, N. J., LB $337,508. overpass on Grenloch branch of Pennsylvania-Reading Seashore Lines, Rte. 42, Sect. 14D, Camden Co. CD 12/18.

▲ **P. T. Cox Contg. Co., Inc.**, 271 Church St., New York, N. Y., LB $1,307,713. bridge between Hoboken and Weehawken at Park Ave., JERSEY CITY, N. J. Bd. Freeholders Hudson Co., Courthouse, Jersey City, N. J. Bids Dec. 13. CD 11/27.

▲ **Charles Vachris, Inc.**, 9024 Ditmas Ave., Brooklyn, N. Y., LB $1,224,420. reconstr. wharf, Bldgs. No. 290, 291 and 292 on north side of city channel, Contr. PN-340, PORT NEWARK, N. J. Office Chief Engineer, Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Bids Jan. 8. CD 12/11.

BUILDINGS—LB & CA

▲ **William L. Crow Constr. Co.**, 101 Park Ave., New York, N. Y. CA Est. $1,000,000. STUDENT UNION BLDG., BROOKLYN, N. Y. Pratt Institute, 255 Ryerson St., Brooklyn, N. Y. CD 3/31/54.

▲ **Colmar Constr. Co.**, 364 Gold St., Brooklyn 1, N. Y. LB $1,701,000 (8 bidders) general constr. PUBLIC SCHOOL, Greene Ave. between Waverley and Washington Aves., BROOKLYN, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Jan. 8. CD 12/3.

▲ **Belterre Homes**, c/o Trylon Realty Co., 98-89 Queens Blvd., Forest Hills, N. Y. Owner Builds. $1,700,000. 90 HOUSES on tract at Park Ave., HUNTINGTON, N. Y.

▲ **Jackson Homes**, c/o Samuel Paul, archt., 89-51 164 St., Jamaica, N. Y. Owner Builds. $8,000,000. 450 HOUSES on tract at 75 St. between Ditmas Ave. and Grand Central Parkway, JACKSON HEIGHTS, N. Y.

▲ **Caristo Constr. Corp.**, 26 Court St., Brooklyn 2, N. Y. CA $3,690,900 (8 bidders) general constr. Thomas A. Edison Vocational HIGH SCHOOL, 168 St. between Grand Central Parkway and 84 Ave., JAMAICA, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Grand total $5,075,325. CD 12/5, under LB;

Heating Maintenance Corp., 220 E. 138 St., New York 51, N. Y. CA $547,325 (6 bidders) heating work (Jamaica, N. Y.);

Bank Electric Co., 126 W. 32 St., New York 1, N. Y. CA $838,000 (11 bidders) electrical work (Jamaica, N. Y.).

▲ **Lawrence Bay Park Homes**, c/o Schuman & Lichtenstein, archts., 369 Lexington Ave., New York 17, N. Y. Owner Builds. $1,000,000. 25 HOUSES on tract at Ruck Hall Rd., LAWRENCE, N. Y.

James Romeo & Assocs., Tuckahoe, N. Y. CA $907,000. general constr. DORMITORY, State University Teachers' College, NEW PALTZ, N. Y. The Dormitory Auth., 55 Grant Ave., Albany 6, N. Y. Bids Dec. 12. CD 11/14.

▲ **National Lead Co., Titanium Alloy Mfg. Div.**, 111 Broadway, New York 6, N. Y. Own Forces and Separate Contracts. PLANT addn. to produce zirconium oxide and zirconium silicates, railroad spur, sewers and utilities, NIAGARA FALLS, N. Y.

Bay Park Homes, c/o John W. Burton, archt., 163-18 Jamaica Ave., Jamaica, N. Y. Owner Builds. $700,000. 52 HOUSES on tract at Weeks Rd., NORTH BABYLON, N. Y.

▲ **Shroder Co.**, Rockhill Lane, Scarsdale, N. Y. CA Est. $7,500,000. 280 HOUSES on tract at Bear Ridge and Old Farm Rds., PLEASANTVILLE, N. Y. Old Farm

(Continued on page 100)

General view of the plant. Inset, closeup of Bar Screen and Disintegrator. Consulting Engineers, Ripple & Howe, Denver, Colorado.

DORRCO BAR SCREEN – SULZER DISINTEGRATOR

Simplifies Screenings in Municipal and Industrial Waste Treatment Plant . . . Biofiltration Flowsheet

The North Washington Sanitation District sewage treatment plant near Welby, Colorado takes care of both domestic and packing house wastes.

To reduce the coarse screenings prior to subsequent treatment steps a Dorrco Bar Screen and Dorrco Sulzer Disintegrator are used in "closed-circuit." Here's how they operate . . . screenings are fed to the Disintegrator, ground to a "mealy" consistency, and returned to the plant flow for further treatment. A portion of the Disintegrator discharge is re-cycled to flush screenings through a trough into the Disintegrator feed sump. Electrical controls automatically operate the two units in conjunction with each other.

Other Dorr equipment in the plant includes a Clarifier, Distributor and Digestor. Plant flow is 1000 GPM minimum; 2000 GPM maximum.

If you'd like more information on this modern answer to the screenings handling problem, write for a copy of Bulletin No. 6400. Dorr-Oliver Incorporated, Stamford, Connecticut.

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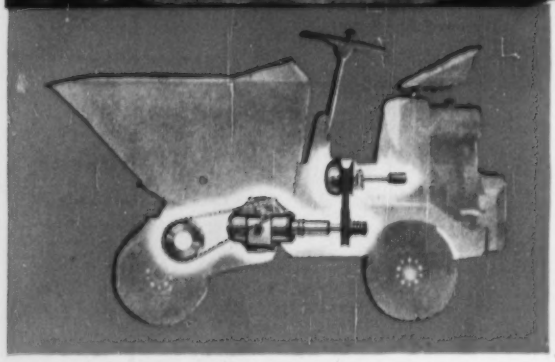

NO CLUTCHING — NO SHIFTING — Big R-15 Moto-Bug now has *automatic power-flow* transmission. All travel is controlled by foot accelerator. You get low speed with high engine torque when maximum pulling power is needed — plus infinite, *smooth* speed changes up to 12 m.p.h. Just set directional travel lever into forward or reverse — step on the accelerator — and go.

3 TOOLS IN ONE — Both sizes of Moto-Bugs, R-15 (at top of page) and this smaller S-10 give you flat-bed, power wheelbarrow and fork lift versatility. Maneuverable, light-weight S-10 carries 1500 pounds on 4-foot platform, has 10 or 15 cu. ft. hopper body, ½-ton (6-foot) fork lift, all these attachments are quickly interchangeable for diversified material-handling.

KWIK-MIX *multiple-tool* **MOTO-BUG®**

your jobs

Have you checked recently into the steadily-rising costs of all your small, time-consuming material handling chores? There's a practical answer in *multiple-tool* Moto-Bug. It brings you power wheelbarrow, fork lift, flatbed service all in *one* low-cost, interchangeable unit that hauls, lifts, loads, unloads and stacks all kinds of materials, supplies.

Lifts ¾ ton — Big, 4-wheel R-15 Moto-Bug with fork lift attachment handles 1500 pounds, at 15-inch load center, and 7-foot height. Forks are 24 or 30 inches long, adjustable 6 to 32 inches wide for pallets, barrels, crates. Hydraulic power raises and lowers the load — tilts the mast 2° forward, 10° back for load pick-up, carry, and release.

Hauls 1 ton— Gravity-dump hopper body converts the R-15 Moto-Bug into a big-capacity power wheelbarrow. It carries up to 2000 pounds of any bulk materials in 15 or 18 cubic foot hopper — takes a full batch of concrete from 11-S or 16-S mixer. Change to 4½-foot platform, and you have a heavy-duty 1-ton truck. What's more, there's 780-lbs. of drawbar pull for towing wagons or carts.

Climbs 25% grades — You get a high rate of production with every attachment, because the R-15 travels at speeds to 12 m.p.h. forward and *reverse* — climbs 25% ramps with full 1-ton hopper load. There's no clutching, no shifting. A simple, *power-flow* transmission *automatically* regulates power output in direct relation to speed and grade requirements. All travel is controlled by foot accelerator. Better check how you can save time, work and money with a material-handling Moto-Bug on your jobs. See your Kwik-Mix distributor — or write to us *today*.

KWIK-MIX DIVISION
KOEHRING COMPANY
Port Washington, Wisconsin

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Lo-Bin® for batching or transit-mix

As a batch plant, Johnson Lo-Bin can be arranged with 2, 3 or 4 aggregate compartments. For transit-mix, one compartment can be used for bulk cement. It has 22 or 44 cu. ft. batcher, up to 4 weigh-beams. Batcher rides out beyond end of bin, dumps onto conveyor, or mixer skip (serves 6-S to 28-S mixers). Lo-Bin has 8, 20, 30-ton capacity, is only 7½ to 9½-ft. high — easily charged by tractor loader. Optional: wheels, tires, tow-bar.

C. S. JOHNSON • Champaign, Ill.
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Koehring 34-E paver hits a top output of 86.7 batches per hour (60-second mixing time). This reserve work capacity offsets normal production delays . . . assures an average of 50 batches an hour, 8 hours a day, at no increase in batching, hauling or finishing equipment. Every mixing operation is automatic, accurate, fast with split-second Autocycle control. Get more facts on big Koehring 34-E *twinbatch*. Also check rubber-tired 16-E.

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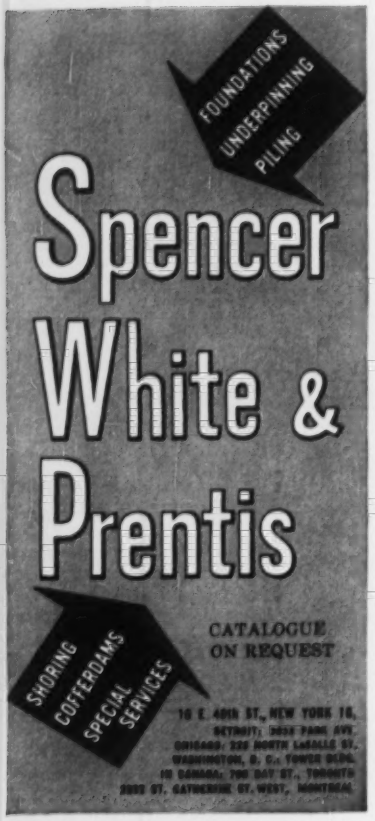

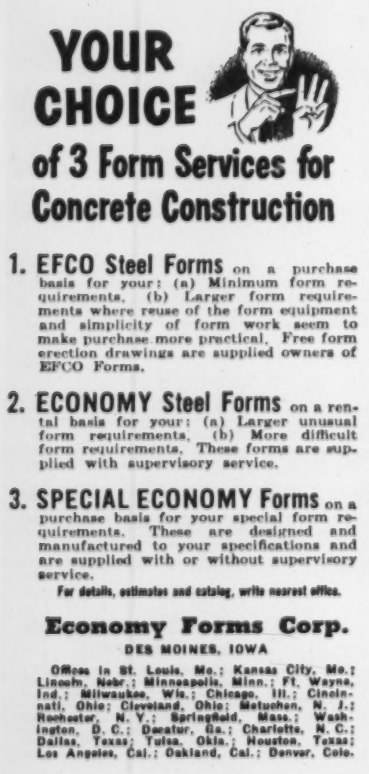
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(Continued from page 97)

Hill Homes, c/o contractor, Oscar A. DeBogdan, Harwood Bldg., Scarsdale, N. Y., archt. Kramer & Kramer, 33 W. 42 St., New York 36, N. Y., archts.

Woodhaven Estates, c/o Stanley H. Klein, archt., 89-31 161 St., Jamaica, N. Y. Owner Builds. $600,000. 25 HOUSES on tract at Hauppage Rd. south of Jericho Turnpike, SMITHTOWN, N. Y.

Calabro Constr. Co., 401 Park Ave., Linden, N. J., CA $550,000. CONVENT, ELIZABETH, N. J. St. Mary's Convent, 237 S. Broad St., Elizabeth, N. J. CD 5/4.

Park Circle, Inc., c/o Geo. M. Butts, 21 Michigan Ave., Kenilworth, N. J. Owner Builds. $700,000. 35 HOUSES, Circle Rd., Florham Park, FLORHAM, N. J. Azeglio Pancani, Jr., 95 Madison Terrace, Springfield, N. J., archt.

▲ **Mahony-Troast Constr. Co.,** 790 Bloomfield Ave., Clifton, N. J., CA $1,250,000. 127x447 ft. BOTTLING PLANT, 32 ft. high, incl. 122x122 ft. garage, Polifly Rd. and Newman St., HACKENSACK, N. J. Galler 7-Up Bottling Co., 173 Atlantic St., Hackensack, N. J. Lester Cohen, 234 Clinton Pl., Hackensack, N. J., archt. CD 8/30.

▲ **Abe Toll,** 4908 Monument Ave., Phila., Pa. Separate Contracts. $1,250,000. RESIDENTIAL DEVELOPMENT, Hughes Park area, GULPH MILLS, PA.

Stehle & Beans, Forest Dr., Annapolis, Md. CA $588,200. Point Pleasant Elementary SCHOOL, Point Pleasant, ANNAPOLIS, MD. Anne Arundel Co., Bd. Educ., Annapolis, Md. CD 1/4, under LB.

D. F. Rodney, 1816 Jefferson Place N. W., Wash., D. C., LB $824,500. construct and finance 46-unit Capehart HOUSING, Fort Lesley J. McNair, WASH., D. C. U. S. Eng., 1 and Douglas Sts. N. W., Wash. 25, D. C. Bids Jan. 8. CD 12/12.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 22 North Carolina
STREETS AND ROADS
January 22 North Carolina January 23 Louisiana

▲† **La., New Iberia**—RUNWAY, etc—BA 2/14—Officer in Charge of Constr., Eighth Naval Dist., Bldg. 16, U. S. Naval Station, New Orleans, (Algiers) (a) 8,025 ft. long by 200 ft. wide runway (b) 8,950 ft. long by 200 ft. wide runway (c) 8,000 ft. long by 200 ft. wide runway (d) 21,000 lin. ft. appurtenant concrete taxiways (e) 163,000 sq. yd. concrete parking apron (f) 450,000 sq. yd. bit. paved shoulders adjacent to runways, taxiways and aprons (g) complete storm drainage sys. (h) airfield lighting installation (i) misc. work, Naval Auxiliary Air Station, NBy 6394, Spec. 6994/56. Plans deposit $100. CD 9/28.

▲† **Tenn., Tullahoma** — TEST SECTION CARTS — BA 2/28—U. S. Eng., Tullahoma, constr. 4 test section carts for propulsion wind tunnel, Arnold Engineering Development Center. $5,442,943. CD 11/26, under LB.

BUILDINGS—BA

▲ **Ala., Fort Rucker** — HOUSING — BA 1/29 — U. S. Eng., 2301 Grant St., Mobile 7, construct and finance 240 frame, brick trim Capehart housing units, second phase. CD 8/27.

BUILDINGS—SLC

▲ **Ky., Lexington**—HOSPITAL—St. Joseph's Hospital, Sisters of Charity, 1701 Dixie Hy., Lookout Heights, soon lets contract 7 story, rein.-con., steel, brick hospital, Headley Rd. and Harrodsburg Pike, $4,000,000. Potter, Tyler, Martin & Roth, 128 E. Sixth St., Cincinnati, O., archts. Proctor-Ingels, 915 S. Limestone St., Lexington, engrs. CD 11/23.

HEAVY CONSTRUCTION—LB & CA

FLORIDA—State Rd. Dpt., Tallahassee,
R. H. Wright & Son, Inc., Box 781 Fort Lauderdale, Fla., CA $741,000 (4 bidders), base with surf., b. conc. 90 ft. prestressed concrete slab bridge 2.795 mi. SR 7, S-12 (5), Job 8610-202, Broward Co. Awarded Jan. 2. CD 5/29, under LB.

† **Robert E. Lee Constr. Co.,** Manning, S. C., LB $565,131. Canal 18, Section 2 in N. E. Palm Beach County, Central & Southern Florida Flood Control Proj., CIVENG-08-123-57-37, FLORIDA, U. S. Eng., P. O. Box 4970, Jacksonville 1, Fla. Bids Jan. 3. CD 12/3.

▲† **Standard Dredging Co.,** 80 Broad St., New York, N. Y. CA $2,377,815. widening and deepening Hillsboro Bay Channel, Hillsboro Bay Channel Tampa Harbor, ENG-08-123-57-12, FLORIDA. U. S. Eng., Box 4970, Jacksonville, Fla. Bids Oct. 4, awarded Jan. 3. CD 10/9, under LB.

Traylor Bros., Sta. B, Box 66, Evansville, Ind. LB $773,815 (7 bidders) Contr. 226B, 4,500 ft. 8 in. Ohio River Intercepter Sewer, Sect. B, LOUISVILLE, KY. Metropolitan Sewer Dist., 412 W. Market St., Louisville, Ky. Bids Jan. 8. CD 11/29.

▲ **TENNESSEE**—State Hy. Dpt., Nashville,
Tenn.—**John L. Brinkley,** Shelbyville, Tenn., CA $635,222, crushed stone surf., bit. materials 9.071 mi. State Rte. 28. Proj. F-029-1-(12), Pt. I, Bledsoe and Cumberland counties; CA $632,934, crushed stone, bit. materials, paving, constr. 2 parallel concrete deck girder bridges 1.819 mi. State Rte. 153. Proj. F-074-1-(3), Hamilton Co.;
Tenn.—**W. E. Graham & Sons,** Cleveland, N. C., CA $780,791. crushed stone, bit. materials surf., constr. 4 concrete box type bridges 5.393 mi. State Rte. 37. Proj. F-037-1-(4), Carter Co.;
Tenn.—**Forcum-Lannom, Inc.,** Dyersburg, Tenn. CA $553,563. widen and resurf. with gravel and bit. materials, constr. concrete curbs, parking lanes, sidewalks, storm sewerage sys. 1.879 mi. State Rte. 43. Proj. F-005-3-(2), Gibson Co.;
Tenn.—**J. B. Michael & Co., Inc.,** 1021 Heywood St., Memphis, Tenn. CA $201,261. gravel or chert surf. and bit materials, constr. 2 bridges 3.046 mi. State Rte. 14, Proj. F-014-2-(14), Shelby Co. Grand total $2,803,771. Bids Nov. 16. CD 11/23, under LB.

BUILDINGS—LB & CA

▲ **Fluor Corp.,** 2500 Atlantic St., Los Angeles, Calif. CA Est. over $1,000,000. gas treating and sulphur recovery PLANT, YORKTOWN, Va. American Oil Co., American Bldg., Baltimore, Md.

Allan Wesley, 267 North Ave. N.E., Atlanta, Ga., CA $750,000. 5 story OFFICE BLDG. contemporary design, continuous strip alum. windows and precast granite, concrete frame constr., fully air-conditioned fluorescent lighting, ATLANTA, GA. Atlanta Development Co., 1180 W. Peachtree St., Atlanta, Ga. Willner & Millkey Archts., 761 Peachtree St. N.E., Atlanta, Ga., archts.

Ware Constr. Co., Waycross, Ga., CA $731,421. SCHOOLS, BLACKSHEAR, GA. Ga. State School Bldg. Auth., 244 Washington St. S. W., Atlanta, Ga. Bids Nov. 1. CD 11/8, under LB.

▲ **Jack Culpepper Contractors,** 114 E. 5 Ave., Tallahassee, Fla., CA $1,091,400. SCHOOLS, THOMASVILLE, GA. Ga. State School Bldg. Auth., 244 Washington St. S. W., Atlanta, Ga. Bids Oct. 30, awarded Nov. 9. CD 11/5, under LB.

▲ **Grover Constr. Co.,** Box 2921, West Palm Beach, Fla. LB $1,024,000. constr. BUILDINGS, water systems, site imprvs., installation of liquid oxygen production equip. and appurtenant work (Part C), Cape Canaveral, COCOA, FLA. Air Products, Inc., Box 1121, Chatworth, Calif. Bids Dec. 4. CD 11/29.

Caldwell-Scott Eng. & Constr. Co., 340 S. E. 24 St., Ft. Lauderdale, Fla. CA $685,156. 75-room "Carlsbad" HOTEL, S. W. 6 Ave. and S. W. 14-Court, FORT LAUDERDALE, FLA. Carlsbad of Fort Lauderdale, c/o Robert G. Jahelka, archt., 701 E Broward Blvd., Fort Lauderdale, Fla. Bids Dec. 28, awarded Jan. 2. CD 1/4, under LB.

▲ **Bd. Comrs. of State Institutions,** State Capitol, Tallahassee, Fla., rejected bids, Stage 2, South Florida State Mental Hospital, Pembroke Rd. and N. W. 27 Ave., FORT LAUDERDALE, FLA. LB $4,545,000. CD 12/27, under LB.

Rannie Terral, Box 545, Farmerville, La. LB $748,926. (11 bidders) constr., remodeling Morehouse General HOSPITAL, BASTROP, LA. Morehouse Parish Police Jury, Bastrop, La. CD 10/16.

Al J. Schneider, 3720 Seventh St. Rd., Louisville, Ky. LB $589,490. (7 bidders) HOSPITAL addn., OWENSBORO, KY. Our Lady of Mercy Hospital, Junction and Ford Ave., Owensboro, Ky. Bids Jan. 4. CD 12/17.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 23 Michigan

▲ **ILLINOIS**—BA 1/28—Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago,
Calumet Skyway Toll Bridge—Sec. 7-D-3 & 7 E-3, furn. placing concrete deck rein. steel, hand-rail, pipe drain from Ave. N. to Illinois-Indiana State Line, $1,200,000. DeLeuw, Cather & Co., 150 N. Wacker Dr., Chicago, cor-or. engr. Hazelet & Erdal, 53 W. Jackson Blvd., Chicago, sec. engr. CD 5/11, under Streets & Roads.

▲ **Mich., Farmington**—MAUSOLEUM—BA 1/29—Holy Sepulchre Cemetery, Farmington (selected list bidders), mausoleum, West 10 Mi. Rd. $1,000,000. Harley, Ellington & Day, 153 E. Elizabeth St., Detroit, Zone 1, archts. CD 12/6.

▲ **ILLINOIS**—BA 1/31—Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago,
Kane Co.—Cont. N-6-a, grading, drainage, paving, precast concrete bridges, 4.64 mi. from E. of Fox River to E. of Bartlett Rd. $4,400,000. Tecon Engineers, Inc., 314 Wilkinson Ave., Frankfort, Ky., engr. CD 5/11.

O., Cincinnati—BA On Or About 2/15—City, City Hall, Sect. 5, east branch Ohio River Interceptor. $600,000. Plans deposit $10. Havens & Emerson, Leader Bldg., Cleveland, engrs. CD 10/19, under LB.

BUILDINGS—BA

▲ **O., Cincinnati**—HOME FOR AGED—BA 1/25—Bd. Comrs. Hamilton Co., Court House, home for aged. $3,500,000. Plans deposit $75. Extended date. Hake & Hake, Gilbert Ave., and Samuel Hannaford & Sons, Dixie Terminal Bldg., archts. Bodenstein & Schuster, Second Natl. Bank Bldg., engrs. CD 12/5.

HEAVY CONSTRUCTION—LB & CA

† **U. S. Eng.,** 830 W. Broadway, Louisville Ky., rejected bids Dec. 13, instrumentation for Bldg. 45, Area B, Research Facility, Test and Missile, Wright Patterson Air Force Base, ENG-15-029-57-19. DAYTON, O. LB $729,570. CD 12/19, under LB.

▲† **U. S. Eng.,** P.O. Box 59, Louisville, Ky., rejected bids Dec. 12, furnish equip. for Building 45,

Research Facility, Test and Missile, Wright Patterson Air Farce Base, ENG-15-029-57-18, DAYTON, O. LB $1,524,866. CD 12/17, under LB.

▲ **Talbot Constr. Co.**, Winchester, Ky., CA Est. $7,000,000-$8,000,000. freight yards between Struthers and Lowellville, STRUTHERS, O. Pittsburgh & Lake Erie R.R. Co., E. G. Brisbin, ch. engr., P. & L. E. Terminal Bldg., Pittsburgh 19, Pa., and New York Central System, F. H. Simpson, ch. engr., 466 Lexington Ave., New York 17, N. Y.

▲ **Sheehan Pipe Line Constr. Co.**, 2233 Olive St., St. Louis, Mo., CA $2,000,000. reconditioning, pipe replacements and rerouting 116 mi. products service line from Huntington to Griffith, INDIANA. Buckeye Pipe Line Co., 30 Broad St., New York 4, N. Y.

▲ **Economy Plumbing & Heating Co.**, 1308 S. Pulaski Rd. Chicago, Ill. LB $2,081,000. W.-SW sewage treatment works addn., W. of S. 52nd Ave., S. of W. Pershing Rd., N. of r/w Chicago, Ill. Western R.R., Stickney, CHICAGO, ILL. Metropolitan Sanitary Dist. of Greater Chicago, 100 E. Erie St., Chicago, Ill. Bids Jan. 2. CD 12/28.

▲ **Charles B. Johnson & Sons, Inc.**, 6 N. Michigan Ave., Chicago, Ill. LB $5,415,800. (6 bidders) 106 St. and Doty Ave. Incinerator, CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids Jan. 8.

Tamaro Contractors, Inc., 2727 E. Layton Ave., Cudahy, CA $519,928 (3 bidders) storm sewer in 44th St., WEST MILWAUKEE, WIS. Village, 4755 W. Beloit Rd., West Milwaukee, Wis. Steinhagen & Steinhagen, 2735 W. State St., Milwaukee 8, Wis., engrs. CD 1/2, under LB.

BUILDINGS—LB & CA

Joseph A. Halter Co., 1123 Fulton St. N.W., Canton, O., CA Est. $600,000-$700,000 (5 bidders) BUSINESS OFFICE and DIAL EXCHANGE, ALLIANCE, O. Ohio Bell Telephone Co., 750 Huron Rd., Cleveland 15, O. Bids Dec. 11, awarded Dec. 26. CD 11/21.

▲ **Ray Lawrence**, 217 Wyoming Ave., Lockland, O. Own Forces. $1,750,000. sixty-four 1 story, bsmnt., brick HOMES, off Bonham Rd., CINCINNATI, O. Jos. Allen, 5555 Glenway Ave., Cincinnati, O., engr. Awarded Jan. 7.

H. & I. Dolinsky Co., 1931 Hayden Ave., Cleveland 12, O., CA Est. $800,000. 90-unit MOTEL, 1550-1620 Superior Ave., CLEVELAND, O. Superior Manor, Inc., E. S. Kelin, pres., Chester-12th Bldg., Cleveland 14, O. Awarded Dec. 26. CD 12/19.

H. G. Christman, 850 Fellow St., South Bend, Ind., CA $555,377 John Marshall SCHOOL, Byron Dr., Broadmoor Addn., SOUTH BEND, IND. South City of South Bend, 228 S. St. Joseph St., South Bend, Ind. Bids Dec. 17. CD 12/28, under LB.

▲ **Lawrence Damore**, 279 E. Burlington Ave., Riverside, Ill., CA $2,300,000. 1 story, 220,000 sq. ft. FACTORY, 96 acre site, York Rd. and Lawrence Ave., BENSENVILLE, ILL. Flick-Reedy Corp., 2040 Hawthorne Ave., Melrose Park, Ill. Zay Smith Assocs., 507 S. LaGrange Rd., LaGrange, Ill., archts.

Turner Constr. Co., 105 W. Adams St., Chicago, Ill. CA $800,000. remodel adjacent 4 story bldg. from garage to BANK BLDG., CHICAGO, ILL. Harris Trust & Savings Bank, 115 W. Monroe St., Chicago, Ill. Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, Ill., archts.

▲ **Power Constr. Co.**, 125 S. Marion St., Oak Park, Ill. CA $1,500,000. Central Catholic HIGH SCHOOL, Joe Orr Rd. and Ashland Ave., CHICAGO HEIGHTS, ILL. Catholic Bishop of Chicago, 719 N. Wabash Ave., Chicago, Ill. Bids Nov. 19. CD 11/8.

▲ **Contractors & Builders, Inc.**, 228 N. LaSalle St., Chicago, Ill. CA $1,500,000. 5 APARTMENT BLDGS., 105 units, paving, Cicero Ave., Crain, Niles Center Rd. and Skokie Blvd., SKOKIE, ILL. Town House Bldrs., 228 N. LaSalle St., Chicago, Ill. Raymond A. Peterson, 4014 Dempster St., Skokie, Ill., archt.

▲ **Selmer Co.**, 128 N. Pearl St., Green Bay, Wis. LB $1,000,000. 1 story, 322x363 ft. concrete block FACTORY, 60x162 ft. steel, concrete loading dock, ASHWAUBENON, WIS. S. J. Campbell, 1125 Monroe Ave., Green Bay, Wis. R. W. Surplice, 131 Main St., Green Bay, Wis., engr.

Chas. Smith & Son, Fond du Lac, Wis., CA $612,300. general contract SCHOOLS, PLYMOUTH, WIS. Bd. Educ., Plymouth, Wis. CD 11/23.

▲ **Shubow & Hollo, David Shubow**, 600 Lawyers Bldg., Detroit, Mich. Owner Builds. $2,000,000. 2 story Fontaine Garden APARTMENTS, 10 Mile east of Greenfield, SOUTHFIELD, MICH. James W. Conn., 20169 James Couzens Hy., Detroit, Mich., archt.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

January 25 Minnesota

STREETS AND ROADS

January 25 Minnesota

† **N. M., Las Cruces**—ARMY LAUNCHING AREA—BA 2/12—U. S. Eng., P.O. Box 1538, Albuquerque, Army Launching Area No. 2, incl. assembly bldg., White Sands Proving Ground, ENG-29-005-57-2. $500,000-$1,000,000. CD 7/26/56, under LB.

▲† **N. M., Alamogordo**—GUIDED MISSILE ASSEMBLY BLDG.—BA 2/15—U. S. Eng., Box 1538, Albuquerque, guided missile assembly bldg., 135x362 ft. steel frame hangar type, Holloman Air Force Base. $1,000,000-$3,000,000. CD 8/24.

BUILDINGS—BA

▲ **Colo., Grand Junction**—HOSPITAL, etc.—BA 1/23—State of Colo., State Home & Training School, Grand Junction, 1 story, approx. 32,000 sq. ft. hospital and infirmary at State Home & Training School. $2,140,000. Eugene D. Sternberg, 2364 E. 3 St., Denver, engr.-archt. CD 5/2.

▲ **Minn., Silver Bay**—SCHOOL—BA 1/24—Bd. Educ., W. H. Norlen, clk., high school addn. $2,000,000. Plans deposit $50. Bissell & Belair, 1111 Nicollet Ave., Minneapolis, archts. CD 8/21/56.

▲ **Mo., Fort Leonard Wood**—HOUSING—BA 1/29—U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo. 33 family housing units, ENG-23-028-57-49. $500,000-$1,000,000. CD 1/4.

▲ **Neb., Lincoln**—HIGH SCHOOL—BA 2/7—Bd. Educ., 720 S. 22 St., Vine Junior High School. $1,300,000. Unthank & Unthank, 526 Sharp Bldg., archts. CD 7/19.

▲† **Mo., Kansas City**—MANUFACTURING—BA 2/13—Office Wilson & Co., Engineers & Architects, 705 E. Crawford St., Salina, Kan. constr. light mfg. bldg. and support facilities incl. electrical, plumbing and fire protection systems, drives, parking facilities and fencing, Bendix Aviation Corp., Kansas City, Mo., for Atomic Energy Comm., Albuquerque, N. M., $2,200,000-$2,400,000. CD 12/5.

▲ **Kan., Fort Leavenworth**—HOUSING—BA On Or About 2/14—U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo., construct and finance 100 housing units (Capehart), ENG-23-028-57-51. CD 12/14.

▲ **Neb., Lincoln**—HIGH SCHOOL—BA 2/28—Bd. Educ., 720 S. 22 St., Charles B. Dawes Junior High School. $1,250,000. S. A. Solheim & Assoc., 324 Sharp Bldg., archts. CD 8/15.

BUILDINGS—SLC

▲ **Mo., Pagedale (St. Louis 14 P.O.)**—Stix, Baer & Fuller, Leo C. Fuller, chn. bd., 601 Washington Ave., St. Louis, soon lets contract, 2-level steel, concrete, masonry, 420,000 sq. ft. service bldg. housing warehousing and delivery operations, administrative offices, personnel facilities, inactive warehouse storage, etc., Kingsland Ave. and Terminal R.R. $1,800,000. Abbott, Merkt & Co., 10 E. 40 St., New York, N. Y., archt.-engrs. CD 2/10.

▲ **Tex., Dallas**—PLANT—Texas Instruments, Inc., 6000 Lemmon St., Dallas, soon lets contract plant, near Richardson. $4,000,000.

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228 E. Martin St., San Antonio, and A. B. Swank, 2611 Cedar Spring St., Dallas, archts. Sam B. Zisman, 228 E. Martin St., San Antonio, assoc. archts. CD 1/7.

HEAVY CONSTRUCTION—LB & CA

▲ **George A. Gerstner d/b/a Electric Service Co.**, 2209 S. 12 St., St. Louis 4, Mo. CA **$1,229,678**, est. $1,328,000. installing mercury vapor lighting and underground conduit on Grand Blvd. and East Grand Ave. from Holly Hills Blvd. to North Broadway; 8.26 mi. Franklin and Easton Aves. from North Jefferson Ave. to western city limits, 4.85 mi. and on Gravois Ave., Grand to Chouteau Ave.; 13 St. Cass Ave. to Mullanphy St. and parts of Mullanphy and Palm Sts.; and North Florissant Ave. 4.09 mi., ST. LOUIS, MO. City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 Blvd. and Market St., St. Louis 3, Mo. Bids Oct. 23. CD 9/24.

▲† **U. S. Eng.**, 1709 Jackson St., Omaha, Neb., rejected bids Nov. 15, outlet works, Stage No. 5 Control superstructure Oahe Reservoir, ENG-25-066-57-30, SOUTH DAKOTA. LB **$1,887,777**. CD 11/20, under LB.

▲ **COLORADO**—State Hy. Dpt., 4201 E. Arkansas St., Denver,

Colo.—**Dominic Leone Constr. Co., Inc.**, 818 Oak St., Trinidad, Colo., CA **$1,166,035**, est. $1,134,000. grading, b. conc., structures, 2.845 mi. combined for constr. with Air Force Academy Proj. AW-1-01-12, grading, structures 0.845 mi. Colorado Springs, Colo. Proj. IN 002-2 (40).

Colo.—**McMillon Constr. Co.**, 3050 S. Huron St., Englewood, Colo., CA, **$391,794**, est. $440,000. plant mix asph. surf. 3.432 mi. Combined Colo. Proj. Nos. F 005-4 (6) and F 005-5 (7), Elbert and Lincoln Counties. Bids Jan. 3. Mark U. Watrous, state hy. engr. CD 7/9.

▲† **Brown-Olds Plumbing & Heating Co.**, Box 1215, Colorado Springs, Colo. CA **$1,067,000**. gas and electric distr. sys., Air Force Academy, Inv. 05-613-57-11, COLORADO SPRINGS, COLO. Dpt. Air Force, Air Force Academy Constr. Agency, Box 1670, Colorado Springs, Colo. Bids Dec. 27, awarded Jan. 2. CD 1/3, under LB.

▲† **V & N Constr. Co.**, Box 834, Lubbock, Tex. CA **$1,633,279**. dormitories and dining halls, Clovis Air Force Base, ENG-29-005-57-6, CLOVIS, N. M. U. S. Eng., Box 1538, Albuquerque, N. M. CD 12/20, under LB.

BUILDINGS—LB & CA

Lovering Constr. Co., 59 W. Kellogg Blvd., St. Paul, Minn. CA **$610,000**. general constr. 1 story, 401x561 ft. WAREHOUSE, 1921 Case St., ST. PAUL, MINN. Capital Warehouse Co., 1080 N. Hazel St., St. Paul, Minn. H. S. Chapin, Rte. 8, St. Paul, Minn., archt.

Sheehy Constr. Co., 1255 Larpenteur Ave. W., St. Paul, Minn. LB **$719,400** (8 bidders) general constr. 4 story, ground floor single students' HOUSING, east of Cleveland Ave. and north of Buford St., ST. PAUL, MINN. Regents of the University of Minnesota, C. A. Smith, purch. agt., 404 Administration Bldg., Minneapolis, Minn. Bids Jan. 8. CD 12/20.

▲† **Green Constr. Co.**, Manhattan, Kan. LB **$1,770,490**. remodel and modernize BARRACKS and MESS HALLS, FORT RILEY, KAN. Procurement Office, Fort Riley, Kan. Bids Dec. 14. CD 9/12/55.

▲ **Tri-State Constr. Co.**, Box 851, Amarillo, Tex. CA **$2,098,330**. SENIOR HIGH SCHOOL, Tascosa, AMARILLO, TEX. Amarillo, Independent School Dist., 508 Johnson St., Amarillo, Tex. Bids Dec. 19. CD 1/7, under LB.

▲ **U. S. Eng.**, Box 1538, Albuquerque, N. M., cancelled bids to have been opened Jan. 21, construct and finance, 490 unit, frame, masonry NCO HOUSING, Fort Bliss, Inv. ENG-29-005-57-7, EL PASO, TEX. Est. **$5,888,000**. CD 11/15.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
February 6 California

BUILDINGS—BA

Wash., **Tacoma**—SCHOOL—BA 1/29—School District No. 10, Central School Bldg., three 1 story bldgs., totalling 75,000 sq. ft. for H. F. Hunt Junior High School, S. 8 and Mildred St. $800,000. Plans deposit $25. R. B. Price, 2907 A St., archt. CD 5/16/55.

Calif., **Paso Robles**—DORMITORIES—BA 1/30—State Div. Architecture, 1100 S. Grand Ave., Los Angeles, two 1 story 8,120 sq. ft., brick wall dormitories; 1 story, 8,430 sq. ft. vocational bldg., dining room and class room addns., administration and commissary bldgs. addns., 1,370, 1,750, 3,000 and 1,590 sq. ft. respectively; 3,500 lin. ft. security fencing, Paso Robles School for Boys. $767,500. Plans deposit $50. CD 4/24.

▲ Calif., **San Francisco**—OFFICE—BA 1/1—Crown-Zellerbach Corp., 343 Sansome St., 22 story, 230,000 sq. ft. office bldg., bsmnt. garage for 200 cars, 7 elevators, 20,000 sq. ft. landscaping, rein.-con. constr., Market, Bush and Battery Sts. $10,000,000. Plans deposit $100. Hertzka & Knowles, 85 Post St., archts., H. J. Brunier, Sharon Bldg., engr. CD 10/10.

HEAVY CONSTRUCTION—LB & CA

▲ **WASHINGTON**—State Hy. Comn. Olympia,
Erland & Blickle 8265 North Borthwick Ave., Portland, Ore., LB **$1,199,762**, clearing, grading 2.857 mi. State Hy. 12-B between Megler and Knappton in Pacific Co. Bids Jan. 8. CD 12/31.

▲† **C. J. Montag & Sons, Inc.**, 7805 N.E. Halsey St., Portland, Ore., **Carl Halvorson, Inc.**, 10626 S.W. Pacific Hy., Portland, Ore., **Babler Brothers, Inc.**, 4617 S. Milwaukee Ave., Portland, Ore., **McLaughlin, Inc.**, Ford Bldg., Great Falls, Mont. and **Austin Constr. Co.**, 2930 4th St. S., Seattle, Wash., CA **$29,475,396**. power house structures at Ice Harbor Dam, Walla Walla Co. Inv. 57-16. WASHINGTON. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Dec. 18. CD 12/20, under LB.

▲† **General Electric Co.**, Public Service Bldg., Portland, Ore., CA **$9,600,000**, six 82,105 kva main unit generators, The Dalles Dam, Wasco Co., CIVENG-35-026-57-85, OREGON. U. S. Eng., Pittock Block, Portland, Ore. Bids Dec. 4, awarded Jan. 3. CD 12/6, under LB.

▲ **L. E. Dixon Co.**, 409 South California St., Los Angeles, Calif., LB **$9,186,000**, sports arena, Exposition Park, LOS ANGELES, CALIF. City Coliseum Comn., 3911 S. Figueroa St., Los Angeles, Calif. Stiles & Clements, 210 W. 7th St., Los Angeles, Calif., archts. Bids Jan. 8.

Milosevich & Zarubica Constr. Co., 1419 Potrero Ave., El Monte, Calif., CA **$574,914**, Glenwood Pl. Storm Drain Proj. No. 169, Burbank, LOS ANGELES, CALIF. Los Angeles Co. Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. Bids Dec. 21, awarded Jan. 4. CD 1/9, under LB.

▲ **Peter Kiewit Sons Co., & Fred J. Early Co., Inc.**, 345 Kieways Ave., Arcadia, Calif., CA **$8,522,412**, storm drain, Slauson Ave. Relief drain, Proj. No. 84, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. Bids Dec. 14, awarded Jan. 2. CD 12/19, under LB.

Webb & White, 7220½ Melrose St., Los Angeles 27, Calif. LB **$581,860**, est. $500,000 (3 bidders) site clearance and excavation, for Hall of Administration, Spec. 1671R-3, Cap. Proj. 7065, LOS ANGELES, CALIF. Bd. Supervs. Los Angeles Co., 501 Hall of Records, Los Angeles, Calif. Bids Jan. 2. CD 12/19.

▲† **Clyde Wood & Sons, Inc.**, P. O. Box 620, North Hollywood, Calif., CA **$1,041,190**, rehabilitate harbor facilities and constr. submerged fuel lines, Spec. 5433-56, POINT MUGU, CALIF. 11th Naval Dist., 1220 Pacific Hy., San Diego, Calif. Bids Dec. 28, awarded Jan. 4. CD 1/8, under LB.

Lentz Constr. Co., 2416 Sutterville Rd., Sacramento, Calif., CA **$673,843**, constr. East Broadway Storm Sewer Proj., SACRAMENTO, CALIF. City, City Hall, 9th and I Sts., Sacramento, Calif. Bids Dec. 27, awarded Jan. 3. CD 1/3, under LB.

BUILDINGS—LB & CA

▲ **England Bros.**, Box 478, Tooele, Utah. CA Est. **$3,000,000**, lime MILL and crusher, near DELLE, UTAH. Marblehead Lime Co. (subsidiary Material Service Corp.), 308 W. Washington St. Chicago, Ill. CD 11/3/55, under Material Service Corp., as owner.

▲ **Fluor Corp.**, 2500 Atlantic Ave., Los Angeles, Calif., CA Est. **$10,000,000**. ALKYLATION UNIT to produce 800,000 bbl. per year high grade gasoline, ANACORTES, WASH. Shell Oil Co., 50 W. 50th St., New York, N. Y.

▲ **Haas & Haynie Constr. Co.**, 575 Pine St., San Francisco, Calif., LB **$2,000,000** (5 bidders) manufacturing PLANT, ANTIOCH, CALIF. Crown-Zellerbach Corp., Airport Way, Seattle, Wash. Bids Jan. 7. CD 12/18.

▲ **Clayco Corp.**, 4392 Clayton Rd., Concord, Calif. Owner Builds. **$1,800,000**. 100 frame, stucco HOMES, CONCORD, CALIF. Charles Denils, 2223 Contra Costa Hy., Pleasant Hills, Calif., archt.

Trojan Constr. Co., 5739 Hollister Ave., Santa Barbara, Calif. Owner Builds. **$600,000**, 50 stucco DWELLINGS, Kellogg Tr. 1230, GOLETA, CALIF. Jones & Emmons, 8925 Beverly Blvd., Los Angeles 48, Calif., archts.

Flowers & Shirley, P. O. Box 369, Culver City, Calif. LB **$716,000**, est. $690,000. Leuzinger HIGH SCHOOL addns., 2nd increment, Units A, J-1, G, P, P-1, K, Lawndale, HAWTHORNE, CALIF. Centinella Valley Union High School Dist., 365 Hawthorne St., Hawthorne, Calif. H. L. Gogerty, 3123 W. 8th St., Los Angeles, Calif., archt. Bids Jan. 4.

Gilbert Martin Constr. Co., 2514 W. Vernon St., Los Angeles, Calif. Owner Builds. **$781,000**, 71 DWELLINGS, 6 Rodin, Nugent and Andlae Sts., LANCASTER, CALIF. Conley Eng. Co., 1248 S. La Cienega St., Los Angeles, Calif., engr.

▲ **William Simpson Constr. Co.**, 2401 Beverly Blvd., Los Angeles 57, Calif., CA **$2,025,000**. 12 story, 60x160 ft., concrete OFFICE-BANK BLDG., 6801 Hollywood Blvd., LOS ANGELES, CALIF. First Federal Savings & Loan Assn. of Hollywood, 6763 Hollywood Blvd., Los Angeles 28, Calif. Robert Field, Jr., 2311 W. 3 St., Los Angeles, Calif., archt. J. G. Middleton, 6311 N. Figueroa St., Los Angeles, Calif., engr.

▲ **Mesa Hills Land Co.**, P. O. Box 173, Santee, Calif. Owner Builds. **$1,009,460**, 96 DWELLINGS, Mesa Hills No. 1, MESA HILLS, CALIF.

▲ **A. Teichert & Sons**, 1931 Stockton Blvd., Sacramento, Calif., **Baldwin Constr. Co.**, Marysville, Calif., **George A. Fuller Co.**, 3100 W. 8 St., Los Angeles, Calif., **Consolidated Western Steel Co.**, 5700 S. Eastern St., Los Angeles, Calif. and **The American Bridge Co.**, 525 William Penn Place, Pittsburgh, Pa., CA Total est. **$4,000,000**. MISSILE TEST STANDS, assembly and modification hangars, CAFETERIA, plant protection and CONTROL BUILDINGS, roads, NIMBUS, CALIF. Douglas Aircraft Co., Inc., 3000 Ocean Park Blvd., Santa Monica, Calif.

Hunsaker & Sons, 8026 E. Las Tunas St., Temple City, Calif. Owner Builds. **$604,000**, 56 frame, stucco DWELLINGS, De La Cour Dr., Taintor Rd., etc., PALMDALE, CALIF.

Associated Constr. & Eng., 2903 Geneva Ave., San Francisco, Calif., LB **$900,000**. 80,000 sq. ft. WHOLESALE DRUG DISTRIBUTION CENTER, SOUTH SAN FRANCISCO, CALIF. Coffin-Redington, 301 Folsom St., San Francisco, Calif.

George Roek Co., P. O. Box 783, Stockton, Calif., LB **$949,850** (7 bidders) 1 story, frame, stucco Lincoln HIGH SCHOOL, STOCKTON, CALIF. Lincoln Unified School Dist., c/o supt., 818 Lincoln Rd., Stockton, Calif. Bids Dec. 28. CD 12/7.

CANADA

BUILDINGS—BA

Sask., Weyburn—FEDERAL—BA 2/6—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., 2 story, bsmnt., 81x140 ft. for bsmnt. and ground floor, 42x98 ft. upper floor federal bldg. $500,000. CD 3/1.

Ont., Kingston—FEDERAL—BA 2/13—Dpt. P. Wks., Hunter Bldg., Ottawa, 3 story, bsmnt., 173x364 ft. granite, limestone, federal bldg., Clarence St. $500,000. Drevor & Smith, 81 Brock St., archts. McGregor, Anderson & Beynon, 2792 Yonge St., Toronto, electrical engrs. CD 8/29.

BUILDINGS—LB & CA

▲ **Christensen & McDonald Ltd.**, 612 Tegler Bldg., Edmonton, Alta., CA **$979,797**, BIOLOGY addn. to agricultural bldg., University of Alberta, EDMONTON, ALTA. Dpt. P. Wks., Edmonton, Alta. Bids Dec. 17, awarded Jan. 2. CD 11/29;
Canadian Comstock Co. Ltd., 2nd Floor Sun Bldg., Edmonton, Alta., CA **$393,613**. mechanical work University of Alberta (Edmonton, Alta.).

▲ **Graham C. Lount**, 600 Viscount Pl., Winnipeg, Man. Owner Builds. **$3,000,000**. 280 low rental HOUSING UNITS, 17-acre site Elmwood District, WINNIPEG, MAN.

▲ **AMF Atomics of Canada Ltd.**, 25 King St. W., Toronto, Ont., CA Total Est. **$1,300,000**. light-water-moderated type Nuclear Research REACTOR for university and industrial research, HAMILTON, ONT. Atomic Energy of Canada Ltd., Ottawa, Ont., The Hydro Electric Power Comn. of Ontario, 620 University Ave., Toronto, Ont., Hamilton College of McMaster University, Hamilton, Ont. Wm. R. Souter & Assocs., 36 James St. S., Hamilton, archts. Awarded Jan. 3. CD 10/30.

▲ **Foundation Co. of Canada, Ltd.**, 166 Douglas St. W., Sudbury, Ont. CA Total est. **$12,500,000**. MILL to produce both nickel sulphide and copper sulphide concentrate, 6,000 tons a day concentrator on site adjacent to Levack Mine, approx. 5 mi. from Sudbury, LEVACK, ONT. International Nickel Co. of Canada, Ltd., Copper Cliff, Ont. Awarded Dec. 26.

Sam Panet, c/o Panet Elec. Co. Ltd., 3011 Dundas St. W., Toronto, Ont. Owner Builds. **$600,000**. 80-unit APARTMENT, 2 Church St., and 10 story underground parking, MIMICO, ONT. CD 10/16.

C. D. Malani, 534 Lawrence Ave., W. Toronto, Ont. Owner Builds. **$600,000**. two APARTMENTS, Pine and Queen Sts., SAULT STE. MARIE, ONT. CD 6/20.

Samuel Stone, 51 Old Park Rd., Toronto, Ont., Owner Builds, **$600,000**, 10 story, rein.-con., masonry, rein.-con., steel APARTMENT, 48 Isabella St., TORONTO, ONT. Bregman & Hamann, 7 Adelaide St. E., Toronto, Ont., archts.

Bennett-Pratt Ltd., 5 Maple Leaf Dr., Weston, Ont., CA Est. **$680,000**. Regent Park Public SCHOOL, TORONTO, ONT. Bd. Educ., 155 College St., Toronto, Ont. Bids Oct. 16, awarded Dec. 31. CD 10/31, under LB.

ALASKA

HEAVY CONSTRUCTION—BA

Alaska, Ketchikan—BA 2/7—City, City Hall, rockfill dam and concrete spillway at Ketchikan Lake; excavate channel between Upper and Lower Ketchikan Lakes; intake structures, etc. for hydro proj. $700,000. Plans deposit $25. R. W. Beck & Assoc., Tower Bldg., Seattle 1, Wash., engrs. CD 1/25.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **Argentina**—BA 4/23—La Oficina de Talleres y Suministros, Water & Power Board, Calle Lavalle 1556 Buenos Aires, dam on Atual River, Province of Mendoza. Alternate plans, light concrete dam carrying two-lane roadway with accessory works, Est. $12,550,000; earth dam, with accessory works, $10.7 million. Project includes irrigation outlet, valve house, conducting tunnel, canal, outlet for hydraulic plant, 100 meter tunnel, roads, flood gates and equipment. CD 10/8/47.

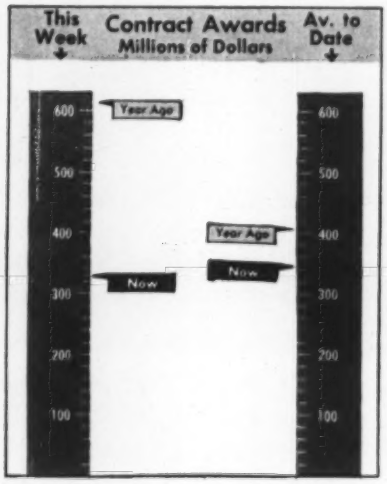
HEAVY CONSTRUCTION—LB & CA

▲ **Petrogas**, S.A. Caracas, Venezuela, CA **$21,450,000** design and construct 207 mi. 26 in. natural gas pipe line between Caracas and fields around Anaco; CA **$4,950,000**. gas distribution system in Caracas Area, VENEZUELA. Republic of Venezuela, P. Wks. Dpt., Caracas, Venezuela. Fulgham Contracting Corp., Camp Hill, Pa., U.S.A., consult. engrs.

(Proposal Advertisement see pp. 113 to 115)

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 3 wks 1957	Chge %
	millions		
Federal	$69.9	$187.7	+35
State and Municipal	107.2	378.3	+1
Total Public	177.1	566.0	+10
Total Private	57.9	468.8	−35
U. S. Total	$335.0	$1,034.8	−16
By Type of Work			
Waterworks	$2.5	$5.7	−69
Sewerage	16.8	36.6	+48
Bridges	6.4	36.1	+13
Highways	22.9	149.9	+27
Earthwork, Waterways	57.9	30.6	+179
Buildings:			
Public, Excl. Housg.	48.3	137.0	−17
Public Housing	9.3	15.1	−44
Private Housing	77.6	202.6	−31
Commercial	16.3	43.5	−75
Industrial	46.1	198.2	−9
Unclassified	30.9	99.5	−15
U. S. Total	$335.0	$1,034.8	−16

NOTE. Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

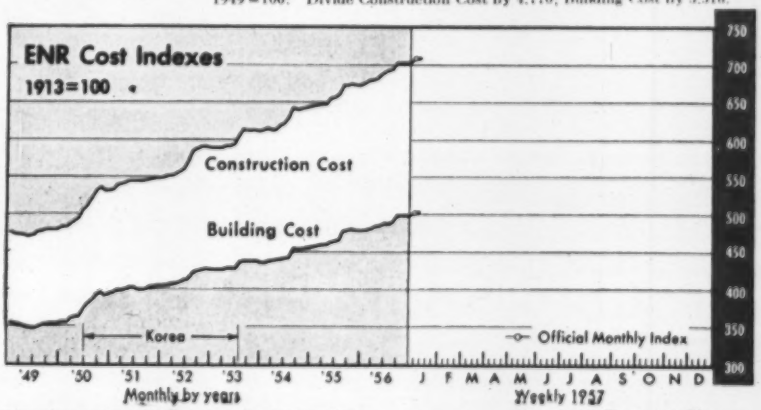
NEW CAPITAL FOR CONSTRUCTION

	Week of Jan. 10	Cum. 2 wks 1957	Chge '56-'57 %
	millions		
Corporate Securities	$216.7	$250.4	+2022
State and Municipal:			
All Except Housing	14.0	33.7	−45
Housing	...	...	...
Federal Loans	+.2	6.9	+11
Federal Aid	...	...	...
Total Nonfederal	$234.9	$291.0	+269
Federal Appropriations:			
In U. S.	...	...	...
Outside U. S.	...	...	...
Total New Capital	$234.9	$291.0	+269

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	Week of Jan. 10 1957	% Change from Dec. 20 1956	% Change from Jan. 12 1956
Construction Cost	708.96	+0.5	+4.3
Building Cost	502.62	+0.6	+4.1

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.



CONTRACTS AWARDED

	1956 December (millions)	1956 12-Mos. (millions)	Percent Change from 1955 Dec.‡	Percent Change from 1955 12-Mos.
Total U. S., ENR reported	$1,590.2	$21,712.0	+17	+16
Private	1,038.4	13,490.4	+41	+16
Public	551.8	8,221.6	−11	+17
State and Municipal	431.0	6,532.9	−19	+21
Federal	120.8	1,688.7	+44	+3
ENR Volume Index, 1913 = 100	624	671	+15	+12

NEW CONSTRUCTION CAPITAL

	December (millions)	12-Mos. (millions)	Percent Change from 1955 Dec.‡	Percent Change from 1955 12-Mos.
Total U. S.	$739.6	$14,213.5	−26	+9
State and Municipal Bond Sales	416.2	4,780.8	−37	−5
Corporate Security Sales	297.9	4,727.0	−11	+31
Federal Loans, Aid (nonfederal work)	25.5	1,229.5	+240	+25
Federal Appropriations (federal work)	0	3,476.2*		+0.3

‡ Based on average week. * Includes funds for outside U. S.

MATERIALS SHIPMENTS

	Unit	Sept. (S) Oct. (O) Nov. (N) 1956	Cum. (No. of Mos.)	Percent Change from Year Ago Mo.	Cum.
Portland Cement, Bur Mines	thous bbls	29,935(S)	236,786(9)	+1	+5
Concrete Paving Awards, PCA	thous sq yd	5,160(N)	78,431(11)	−28	−7
Fabricated Structural Steel	thous tons	276(N)	2,908(11)	+7	+6
Bookings, AISC	thous tons	339(N)	3,609(11)	−2	+8
Reinforcing Bars, Net, AISI	thous tons	250(O)	2,028(10)	+23	+14
Lumber, NLMA	mil fbm	3,156(O)	31,161(10)	−6	−8
Orders	mil fbm	3,180(O)	30,827(10)	+1	−9
Production	mil fbm	3,403(O)	31,974(10)	−1	−3
Douglas Fir Plywood, DFPA, ⅜" basis					
Production (average per week)	mil sq ft	102.0(N)	99.9(11)	+7	+6
Orders (average per week)	mil sq ft	97.8(N)	96.2(11)	+11	+4
Clay Products, Bur Census					
Brick, Unglazed, Common, Face	mil bri	571.2(S)	5,181.2(9)	−16	−2
Vitrified Clay Sewer Pipe	thous tons	169.1(S)	1,418.5(9)	−10	−1
Structural Tile, Unglazed	thous tons	55.5(S)	515.1(9)	−25	−19
Asphalt Products, Bur Census					
Asphalt Roofing	thous sales sqs	6,161(O)	53,027(10)	+6	−4
Asphalt Siding	thous sales sqs	148(O)	1,044(10)	+3	−4
Aluminum, Wrought, Net, Bur Census					
Sheet and Plate (non-heat treatable)	mil lbs	90.7(O)	915.6(10)	−3	+6
Wire and Cable	mil lbs	25.4(O)	255.8(10)	+12	+20
Extruded Shapes (soft alloys)	mil lbs	59.5(O)	544.1(10)	−1	+4

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS	thous	3,186(N)	3,040(11)**	+9	+9
Contractor Failures, Dun & Bradstreet					
Number		171(N)	1,651(11)	+29	+30
Liabilities	thous	$11,099(N)	$92,654(11)	+14	+22

** Average per month

THE LONGER LOOK:

For 1957...

Main trends in the economy . . .

- **Nation's output will rise 5% to $435 billion**
- **Government will spend $5 billion more**
- **Business spending will increase — but at a slower pace**
- **Consumers will have $14 billion more to spend**
- **Money will remain tight**

. . . And how they will affect construction

- **Work put in place will be 5% higher**
- **Public construction will climb 12%**
- **Industrial and commercial will level off**
- **Housing starts will dip near 1,000,000 mark**
- **Costs of labor and materials will rise again**

Trouble Spots Put Blemish on '57 Boom

Business in general and the construction industry as a whole are rolling into 1957 at such a clip that the year looks certain to be better than 1956. But this also looks like the year to ask: "Have we reached the top of the boom?"

Despite an optimistic outlook overall, some industries and some sectors of construction already are experiencing a downturn. Others show signs of leveling off. And, even the gains are clouded by inflation.

Total new construction put in place, in dollar volume, rose 3% in 1956 to $44,258 million according to government estimate. The government forecast points to a rise of 5%—to $46,400 million—for 1957. But, because of the steady upward creep of construction costs, it is conceivable that neither of these represents any increase in the physical volume of construction. (Unfortunately, the statistics on construction volume and costs are not good enough that anyone can be sure.)

Until now, the construction industry has racked up successive increases in both dollar volume and in physical terms every year since 1944. So, if the physical volume of construction put in place has stopped climbing, one of the longest and most impressive booms in U. S. history for an important industrial sector is over.

• How 1957 will be better—Most of the indicators of general trends in business will show increases in 1957, though few of the increases will be as great as in 1955 or 1956:

• Gross national product, the dollar value of all goods and services produced, is expected to reach $435 billion in 1957, up from $412 billion in 1956.

• Consumer spending, which totaled about $266 billion last year, should mount to $280 billion this year, with much of the increase going for services.

• Private domestic investment, including increases in inventories, is expected to rise from about $65 billion last year to $69.5 billion in 1957. According to the latest McGraw-Hill survey, business plans to up its spending on new plants and equipment by 11%, compared with a 22% increase last year over 1955.

• Government spending — federal, state and local—will rise from $79.5 billion last year to $84.5 billion this year. Big increases are in prospect for defense expenditures, as well as for civilian construction and farm aid programs.

• Industrial production will show a moderate increase on a year-to-year basis, up from 143 in 1956 to 147 in 1957 (1947-49 = 100). But this will be just about the rate of production attained in the final months of last year.

The pattern by industry shows, for the most part, a mixture of small gains, small losses and holding steady. The best gains will come in industries that already are pretty well booked up into 1958: railroad equipment, machine tools, instruments and controls, construction machinery, aircraft and electrical apparatus.

Smaller gains are in prospect for chemicals, petroleum products, autos, steel, construction materials, paper products, food and beverages, apparel and electrical appliances. Radio and television sets, textiles, furniture and lumber are expected again to have relatively weak years in 1957.

• Flies in the ointment—Though few are talking about a slump in 1957, business analysts will be keeping a close eye on possible trouble spots. Inflation and the effects of the tight money policy being used to combat inflation are well up on the list.

Of the increases expected in gross national product and business investment this year, about half may represent price inflation. The automatic wage increases in major industry contracts will push up costs. And there are still enough shortages of materials to bring more bidding up of prices. Steel prices seem certain to rise at least once, and perhaps twice, during the year.

Renewed inflation, after four years of stable prices, could upset consumer confidence. And, it would put additional pressure on businesses already hard pressed for cash.

Tight money, which was the result of a huge rise in business borrowing, already is having a broad impact. It is getting much of the blame for the sharp dip in housing starts and is threatening to stifle many municipal construction projects, as well as private industrial and commercial building.

The purpose of a tight money policy, of course, is to put a drag on souped-up activities that produce price inflation. But it is a sprawling operation that trips up other sectors, too. And with poor timing, it can slow down the whole economy.

The construction industry is sure to show big gains in 1957 in public construction, expected to rise 12%.

Percentagewise, the largest increases are forecast for public residential building (+64%), sewage disposal (+23%), conservation and development (+21%) and water supply (+16%). Large dol-

(*Continued on page 106*)

JAEGER SHOWS ALL...new model Rotary Compressors and Pumps, Bridge Builders' Mixers and the big news in Truck Mixers ...all at the Road Show

lar increases will come in highway construction (up $400 million) and educational (up $290 million).

In private construction, new residential construction probably will drop again this year. Dollar expenditures will be off 5%, according to government estimates. And the number of starts probably will range between 1,000,000 and 1,050,000. There should be a substantial rise in expenditures on additions and alterations. Commercial building put in place is expected to be about the same as in 1956; industrial will show a small increase.

Contractors are sure to face rising costs for labor and most materials in 1957. They also are likely to have to live with tight money for most of the year. So long as the Federal Reserve Board and the Administration remain convinced that inflation poses a bigger threat than the slump in homebuilding, credit will be expensive and hard to come by.

Unless credit is eased soon . . .

Homebuilders See 20% Drop in Starts

The Administration's program to take a serious and exhaustive look at tight money and credit policies will do little to relieve homebuilders in 1957—a year that industry spokesmen predict will be another bad one.

Unless credit is loosened quickly, housing starts will drop as much as 20%—to around 800,000 total.

This is the consensus of some 40 homebuilders who exchanged ideas, aches, and pains in a meeting that was conducted in Washington last week. The occasion: another roundtable on housing put on by the National Assn. of Home Builders.

The builders, joined by government officials including representatives of the Federal Reserve Board, Federal Housing Administration and members of Congress, met in panel discussion even as President Eisenhower was proposing in his State of the Union Message that a study of the country's monetary policy be carried out.

The President asked Congress to create a commission of "able and qualified citizens" to inquire into the nature, performance and adequacy of the monetary and credit policy. Though the Administration's definition of "able and qualified" seems to be limited to public personages, the Democrats in control of Congress insist that a national monetary commission will be represented by members selected by Congress—including the congressmen, themselves.

The homebuilders roundtable—which last year correctly forecast a hard year for housing, an increase in cost of developing land, and criticism of the tight money policy—produced some major findings again in its meeting at the Housing Center in Washington last Thursday:

• A 20% decline in housing starts under the 1-million-plus 1956 level unless relief is given from the "mortgage drought." Some builders already are being forced out of business.

• The downturn is more acute in the Southwest than in any other area, with the West suffering, too. The plight of builders is somewhat better in New England and some portions of the Midwest.

• A disturbing trend toward increasing use of the secondary mortgage, carrying increased interest rates to buyers "will prove a major disservice to home buyers."

• Terms under which buyers may get money—even when banks will loan it—are tightening. One builder reported an insistence by bankers in his area for a reduction of mortgage longevity to 20 years.

• The increase in FHA insured mortgage interest rates from 4½% to 5% had not sprung additional money for lending in any siginficant amount, but had eased the discount rate.

• Availability of construction loans is shrinking. Most builders reported that such loans could be obtained only if they could show firm commitments for long-term financing. Newcomers in homebuilding are having even a tougher time.

• Cost of developing land is still going up. A lot selling for $2,200 a year ago would cost $2,500 today.

"There are plenty of customers," one builder reported, "but I simply can't get financing to meet the needs of the people who want and can afford new housing."

Armand Ferland, Pawtucket, R. I., said money is available in his area at par value. But, he said, bankers are beginning to want to reduce the period of amortization to 20 years.

The chairman of the roundtable, Thomas P. Coogan of New York, appealed for continuance of the Federal National Mortgage Assn., and asked Congress to replenish the FNMA's authorization for buying mortgages. This, he said, is important in "keeping us in business."

The Administration will back new Fannie May borrowing authority. And even while there is debate on what kind of a monetary commission should be created to study credit, Administration officials will be looking into ways of giving pinpointed relief to housing. There is still a difference of opinion inside the Administration as to whether housing should be helped. One view, from the Treasury Department is that the economy can stand another period of soft housing so long as general construction—industrial and commercial—continues to boom. But housing officials insist that 1957 housing should still stay above the 1-million total, and aid should be given to see that such a goal is accomplished.

Indeed, Coogan criticized government policies that he said are inflationary at the same time monetary restrictions were tight. Example: government financing of housing for military, and maritime shipping subsidies.

"These should be financed out of government bonds," he said. "But instead the government is using the very money sources from which we get our mortgage money."

Loss of building trades workers was an additional worry advanced at the panel.

Fred Fett, of Atlanta, was quoted in the summation session of the meeting.

"With a cutback in production," he said, "we have to cut down on labor. If we ever do get relief and get back to real production we won't be able to get our workmen back. They're going into other industries that are booming down our way."

Window Glass Producer Cuts Output 30%; Blames Imports

The nation's second largest producer of window glass—Libby Owens-Ford has shut down 30% of its productive capacity for an indefinite period.

Company sources said the shutdown was necessary because of a temporary glut in the market. They blamed their troubles on a rising volume of imports and the decline in homebuilding.

Strong demand from industrial and commercial building has helped to offset the housing drop but L-O-F has lost some ground to the lower-priced imported glass in major markets all along the Eastern Seaboard.

These imports are coming from England, Belgium, France and West Germany.

(*B&F continued on page 108*)

Two scaffolds . . same cost, same age . . but only one still erects fast-as-new because it's

"SKIN PROTECTED" BY GALVANIZING

When we talk about erecting fast as new, we're talking about *real* cost savings for anyone using scaffolding. The painted scaffolding on the left shows the rust and pitting which make it slow to erect. The unrusted scaffolding at the right shows no rust and pitting even though it has been used on construction jobs for two years. It is rust-proofed Universal Ezebilt—the only dichromate galvanized scaffolding. Dichromate galvanizing gives a lasting 'skin protection' in the form of a smooth, lubricative coating, virtually eliminating rust and making scaffold assembly trouble-free. *Years* after you get your Universal Ezebilt scaffolding, it will erect fast-as-new. Panels slip on and off coupling pins without binding. Braces are easy to insert and remove. And . . . it will look better on the job.

And remember, only Universal Ezebilt offers swivel-action "Gravity-Lock" construction—no nuts, no bolts, no loose parts. When next you order scaffolding, be sure to specify the finest—specify Universal Galvanized.

Local sales and rental stocks in all principal cities
Consult classified directories for your Universal Distributor

UNIVERSAL
the only **GALVANIZED SCAFFOLD**
UNIVERSAL MANUFACTURING CORP. · ZELIENOPLE 3, PA.

Construction Markets

An On-the-Spot Report From Seattle

The state of the construction market in the Seattle area sums up to: "very good," with one exception: housing.

Housing starts are 25% below a year ago, principally because of the tight money market; no real improvement is in sight. This is more serious in the Seattle area than in other big cities, because lumbering accounts for a large share of industrial activity—and lumbering cannot prosper without an active housing program.

The depressing influence of tight money extends beyond residential construction—but not far. A $2-million downtown office building is being delayed because of high interest rates, but most prospective builders accept the advice of architects that any savings that might result through possible interest rate reductions in the future will be more than offset by higher construction costs.

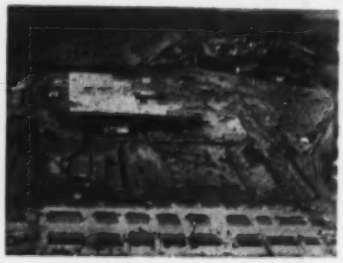
Increased construction costs are accepted as inevitable. Virtually all building craftsmen received wage increases ranging from 5 to 27 cents an hour Jan. 1. Material prices have been relatively stable, particularly in cement and lumber, but increases are likely for these materials after the first quarter.

Taking all these factors into consideration, the construction market in the Seattle area still is "very good" and prospects are for more of the same during the next four months.

The Boeing Airplane Co., which has taken the place of lumbering as the area's prime industry, currently is engaged in a $40-million expansion program at Seattle and nearby Renton.

The Boeing "boom" has encouraged many small suppliers either to move into the Seattle area or to expand their present facilities in the area. This development—the entry of "feeder or satellite plants"—into the area is expected to become more important in the near future. Commercial work also feels the impetus, and is expected to increase during the next four months.

Public construction never has been more active. Seattle voted a $25-million school bond issue Nov. 6. The first effects already have been felt, as the Seattle School Board released funds remaining from previous bond issues. This program will involve schools costing as much as $3.3 million, with the first bid calls scheduled for summer.



BOEING AIRPLANE CO. has $40-million expansion program under way.

Smaller school districts around Seattle voted several million dollars in bonds and are rushing to get their projects under construction before too many contractors get involved in the Seattle program.

The Mountain Pacific Chapter of the AGC, composed of contractors in heavy construction, says its members were busier in 1956 than in any previous year in the chapter's history, even during wartime.

Its members were working "very near capacity" last summer, said the managing director.

Activity will slacken until spring but then is expected to increase even above last year, as first effects of the federal highway program are felt.

Largest single public works project for which bids may be called in the next four months is a $6-million water supply dam on the Tolt River for the City of Seattle.

The Washington Toll Bridge Authority soon will be ready to call bids for the $4-million Manette Bridge at Bremerton, while The Corps of Engineers is near the bid call stage on its $3.5-million Shilshole breakwater.

Several large contracts have been awarded on the $20-million Eagle Gorge flood control project on the Green River; more will be let by spring.

Heavy construction contractors in Seattle heard some good news about another public works project just last week. The Thirteenth Naval District in Seattle disclosed it will take bids late this summer on a $43.5-million dry dock for the Navy Yard at Bremerton, Wash. This will be one of the area's major public works projects.

Largest industrial project on the calendar is a $4.7-million warehouse to be constructed by the Parr Corp., of San Francisco, for lease to Boeing.

This will be dwarfed, however, by a $50-million refinery proposed north of Seattle at Anacortes by the Texas Co.

The company has been exercising options on a site at Anacortes and is expected to announce its construction plans soon. At least one other refinery of similar size is a definite possibility.

In commercial construction, the Group Health Cooperative will call for bids on a $2.5-million addition to its hospital if it can have a street vacated, while the Catholic Archdiocese will award a contract soon for a $2-million seminary. Seattle City Light will enlarge its office building at a cost of $2 million.

Appraisals of the construction prospects for the next four months very definitely are influenced by the long-range outlook, which appears to be even rosier than the immediate future.

Walk down Second Ave. through Seattle's financial district with a banker and he'll tell you: "Better take a good look at this area now, for there will be some marked changes here in the next few years."

He'll go no further, but chances are he's talking about new office buildings, as prime office space currently is at a premium.

The area is facing up to the need for a sewer construction program that will cost more than $50 million over the next 15 years, but first projects under this program hardly can be started before 1958.

Bridge and highway construction projects costing many millions of dollars are in the offing, but only the surface of this program will be scratched in 1957.

Industry and business in general, and the construction industry in particular, eye the next four months as a sort of preliminary of what is to come.

The immediate future will be devoted to getting ready for the bigger projects the continuing growth of the area appears to justify.

New Weapon to Fight Slums

Baltimore creates special agency with far-reaching powers to carry out 20-year, $900-million urban renewal program

A bill creating a powerful new agency that will control all aspects of Baltimore's $900-million slum clearance and redevelopment campaign was signed into law last week by Mayor Thomas D'Alesandro Jr.

The Urban Renewal and Housing Agency will have the task of rejuvenating Baltimore during the next two decades through an ambitious program outlined by a special study board last fall (ENR Oct. 18, 1956, p. 114).

Baltimore's goal is elimination of its present slums and blighted areas within 20 years. About 65,000 sub-standard dwellings will need clearance, and an additional 80,000 dwellings will require conservation, rehabilitation or code enforcement. In all, 45% of Baltimore's dwellings must be cleared or improved.

To finance the program, the city will have to spend $300 million over the next 20 years, with an additional $600 million to be supplied by the federal government, according to the Board's estimates. Private outlays will exceed the combined city-federal grants.

• **Action started**—Several of the reorganization steps listed in the study group's 11-point program of action last fall, have been acted upon in the past three months. The new agency will take over the functions of the Baltimore Redevelopment Commission, the housing code enforcement activities of the Health Department and the community betterment program of the Welfare Department.

Since the same persons who control the Housing Authority of Baltimore will head the renewal agency, public housing also will come under the latter's jurisdiction. Thus, responsibility for executing the functions of urban renewal are now combined in one central group.

The Renewal and Housing Agency would be responsible for project planning in renewal areas, land acquisition and clearance, and area code enforcement activities, according to Study Board recommendations.

The Board's program also would:

• Establish a system of budgeting for capital improvements.

• Encourage private investments in rehabilitation areas through "affirmative programs" administered by the new agency.

• Establish a revolving fund for urban renewal to provide funds to meet limited local cash contribution requirements. The fund would be maintained at a level of $20 to $25 million.

• Set up a staff within the agency to assist neighborhood and community groups in renewal areas.

• **Map zoning changes**—Groundwork for a new zoning code already has been laid by C. William Brooks, zoning specialist assigned to the Baltimore Planning Commission. His staff has prepared 405 land use maps showing the use of each piece of property in the city.

Brooks is slated to become secretary-director of a new zoning commission that will conduct extensive hearings to determine the city's future.

After hearings are concluded, the Zoning Commission will draw up a code which will be submitted to the City Council. The city's lawmakers, in turn, will conduct hearings of their own before final action is taken.

Brooks estimates that it will take about 3½ years before the city will have a new zoning code.

Oliver C. Winston, administrator of the housing authority was appointed director of the Urban Renewal and Housing Agency. He has served as the city's interim co-ordinator of urban renewal for the past year.

A five-member commission was set up as the governing and policy body of the new agency and the housing authority. Chairman is Walter Sondheim Jr., business man and president of the Board of School Commissioners.

Other members include a consulting engineer, a school principal, a bank president and an industrial realtor, now chairman of the Planning Council of the Greater Baltimore Commission.

Industrial Building Still Strong, NCA Says

Industrial building will continue at a high level throughout 1957, perhaps topping the record 1956 volume, the National Constructors Assn. predicted last week at its annual meeting in New York.

The National Constructors Assn. is composed of major engineering and construction firms specializing in such heavy industrial facilities as steel mills, chemical plants, petroleum refineries, power plants and similar facilities.

"Presently existing backlogs plus contracts in process of negotiation assure a high level of industrial construction throughout 1957," the association's president, C. D. Haxby, said.

Haxby, who is vice-president of the Rust Engineering Co., said the upward revision of estimated steel requirements is resulting in an acceleration of new plant construction to obtain added capacity.

Some steel expansion programs may be deferred because of the government's recent decision to deny the industry's requests for fast tax amortization, Haxby conceded. But, most of the projects announced earlier will go ahead, the amount of such deferred construction will not be large, Haxby feels.

Haxby minimized the effect of tight money on the industrial building market.

But, NCA members are not without their troubles, too.

• The engineer shortage is much more serious now than it was a year ago, according to C. B. Whyte, president of Procon, Inc., and J. F. Pritchard, head of the company bearing his name.

• Structural steel is short and there are no signs of any real improvement.

• Costs still are rising with no end in sight.

• Completion schedules are dragging out—sometimes as much as two or three months on a 12 to 15 month job.

Some of the NCA members told ENGINEERING NEWS-RECORD that they would welcome a slight slowdown in the industrial building boom.

"We have more work than we can handle right now," one member commented. "We don't need any more jobs at this time. But we can't just stop bidding, and as a result we may be running the risk of getting overloaded."

Another member told ENR that his firm is becoming more selective about jobs because they already have enough work to keep busy for several months.

"Instead of forcing prices up by trying to build everything at the same time, we prefer to see the boom stretch out a little longer," still another member commented.

But, most agreed that they could take on a much larger construction volume—if they could get enough engineers to break the design bottleneck.

The NCA president did not place the blame for rising construction costs on any group. And, somewhat surprisingly, he praised the building trades unions for attempting to keep "unit labor costs as low as possible consistent with health and safety standards."

WHOLE FLOOR OF BUILDING has been pulled loose by this crane of John J. Duane Company. To do it, workmen drove two holes in the floor (walls and roof had already been removed) and inserted cable down through holes and up to crane. Crane then tugged until floor ripped loose. This is typical of workout the firm's cranes receive, but using Cities Service lubricants they give flawless performance.

Razes buildings, raises efficiency using Cities Service lubricants

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JOHN J. DUANE COMPANY, Quincy, Massachusetts, operates 10 cranes, 14 gasolene and diesel trucks, three forklifts, and a bulldozer . . . all powered and lubricated by Cities Service. The results are notable. Says John Duane: "Using Cities Service C-300 Motor Oil, one of our diesel cranes has gone 9000 hours with absolutely no trouble, and the oil has doubled the period between overhaul for our truck fleet. Furthermore, one gasolene truck has gone 65,000 miles without adding a drop of C-300 between crankcase drains. We're also mighty pleased with Trojan P-2 Grease. Used on the tracks of our cranes, Trojan P-2 keeps them operating flawlessly under the most severe conditions."

Like Mr. Duane, you'll lengthen overhaul periods, cut operating costs when you start using Cities Service products. Get all the facts from a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

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Work-Sharing Clauses in General Use

Work distribution clauses are often used in labor contracts, but few in construction are aimed directly at work-sharing

The peculiar and casual nature of construction employment is again reflected in a U.S. Labor Department study of layoff and work-sharing provisions in collective bargaining agreements.

While nine out of 10 manufacturing industry agreements were found to contain some form of protective procedure for work force reductions, contract provisions for layoffs, recalls and reduced workweek or other work-sharing practices, including restrictions on overtime and subcontracting, turned up as the exception rather than the rule in the construction industry. Of the few that were found, some appeared to be directed at problems other than work-sharing. And of particular significance, in the light of the jurisdictional conflict between industrial unions and the building trades, was the prevalence of subcontracting restrictions, not specifically related to work force reductions, in manufacturing contracts.

In the first study of its kind, the U. S. Department of Labor's Bureau of Labor Statistics has attempted to find out how major labor contracts handle layoffs, recalls and work-sharing procedures, whether the need for a reduced work force stems from seasonal slumps, sporadic changes in business volume, economic recessions or other causes. A survey of all labor contracts covering 1,000 or more workers was begun in 1954 and an analysis of the Bureau's findings is now appearing in a series of reports in the Labor Department's "Monthly Labor Review."

• **Construction**—The survey covered 1,743 contracts. Of these, 124 were in the construction industry. Only six contained layoff provisions; none contained work-sharing provisions. Noting that a fifth of all agreements studied contained no provisions for layoffs or work sharing, the bureau reported that 80% of these were in nonmanufacturing groups, "notably construction, transportation (other than railroads and airlines), retail trades, hotels and restaurants, and services," and more than a third of this group "were found in the construction industry." Layoff provisions that did occur appeared to be limited to construction firms with comparatively steady employment "to a regular crew of men, such as companies engaged in the operation of earth-moving equipment."

General limitations on subcontracting, overtime and shift operations were found in 87 of the 124 construction agreements. Of these, 42 imposed restrictions on subcontracting, 32 restricted overtime and 13 covered shift operations, but none of these were related specifically to the problem of layoffs. Only one contract limited employment practices in the event of slack work.

• **Subcontracting**—Taking a look at all agreements studied, the bureau found that 264 contracts imposed restrictions on subcontracting. One hundred of these (67, covering 371,000 workers, were in manufacturing) made the restriction effective only if the subcontracting would reduce normal job opportunities of regular employees. A typical clause was this: "The company agrees that it will not contract any work which is ordinarily or customarily done by its employees, if as a result thereof, it would become necessary to layoff or reduce the rate of pay of any such employees."

In 164 agreements, however, the restriction on subcontracting was not limited specifically to cases of work force reduction. Seventy-nine of this group were in manufacturing and covered 431,000 workers. "Some," the bureau reported, "prohibited subcontracting of all types of work; others prohibited or limited subcontracting of certain types of work, such as maintenance and repair or set up specific conditions under which work could be subcontracted. . . . Some agreements prohibited subcontracting except in emergency situations. A number of agreements required the company to notify the union prior to subcontracting, either making specific union permission a prerequisite to such action or permitting the union to enter a grievance protesting the action if it so desired. . . . (A few) provided that subcontracting would be permitted only if the company did not have the necessary facilities or the skilled manpower required."

Curb Asked on Wage Boosts

Eisenhower sees unnecessary wage and price increases as a constant threat to the health of the nation's economy

President Eisenhower last week told the nation that the freedom of activity now enjoyed by labor and management can continue only as long as self-discipline is exercised.

His warning was contained in the State of the Union Message delivered on Thursday to the first session of the Eighty-Fifth Congress and was directed to wage and price policies of labor and management, which the President discussed in general terms. Specific recommendations on changes in the various labor laws will be contained in future messages to Congress. Some may come from agency or department heads.

Increases in wages and other labor benefits, the President said, must be "reasonably related to improvements in productivity" if the nation's economy is to remain healthy and free from inflation. Correction of "obvious injustices" was the only exception specifically mentioned. The President also asserted that the public generally, as well as labor, has a right "to share in the benefits of improvements in technology."

At the same time, he told industry that "unnecessary price increases" are equally unsound. Although he offered no formula beyond the assertion that a "reasonable profit" is essential, he said that business leaders, in the national interest, must "studiously avoid those price rises that are possible only because of vital or unusual needs of the whole nation."

The President characterized "unwise struggles for immediate gain" by either group as a constant threat to the nation's economy and suggested that the inflationary tendencies they provoke can be materially checked or nurtured by the wage and price policies pursued by labor and industry.

In these fields, he noted, the opportunity for self-discipline, as a definition

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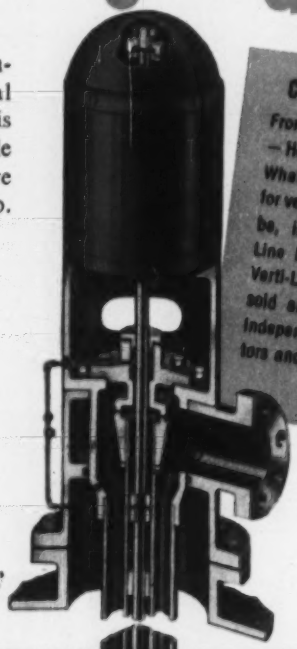

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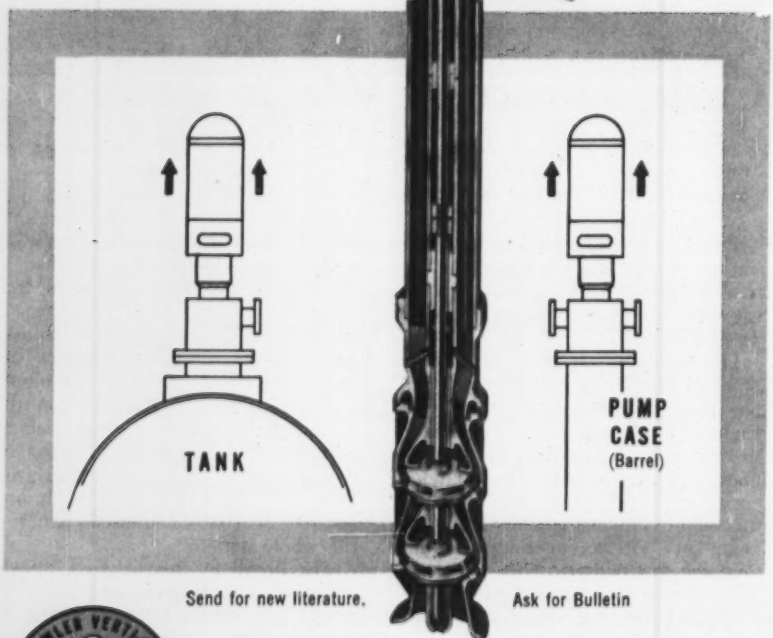

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of freedom, has a special application. "Should we persistently fail to discipline ourselves," said the President, "eventually there will be increasing pressure on government to redress the failure," and freedom will "step by step disappear."

State Labor Groups Aim at Unity in Political Action

For the first time in the history of Michigan labor, the State Federation of Labor, including members of the AFL-CIO building trades, will be represented at the annual State Legislative Conference of the CIO.

At the moment, the State AFL and CIO groups are far apart on many fronts, and merger of the two groups has not yet been accomplished. But members of labor's Committee on Political Education hope that the two groups will be welded into an effective unit for political purposes before the 1958 elections.

Among the members of the Detroit Building and Construction Trades Council who will attend the conference are Marion Macioce, vice president; L. M. (Boots) Weir, head of the Carpenters District Council; and Lester P. O'Bryant of the Painters District Council.

Contractors Form Committee With Sheet Metal Workers

A joint committee of sheet metal workers and contractors in Denver has been organized to promote the interests of the sheet metal industry.

In addition to public relations work among contractors and the public, the Sheet Metal Joint Committee also will seek to improve labor-management relations in its field.

The committee is composed of six men—three each from the Sheet Metal Contractors Association and Local 9 of the sheet metal workers union.

Strike for Higher Wages Hits Pittsburgh Construction Jobs

A strike of 3,000 workers in a dispute over wages halted construction earlier this month on many of the big projects in Pittsburgh.

The walkout began on Jan. 2 after wage negotiations broke off. The Common Laborers Council was seeking a 9% wage boost plus a pension plan. A 7% increase reportedly was offered by a constructors' association.

Projects affected included Allegheny County's sanitary system and the downtown section of the Penn-Lincoln Parkway.

IBEW Looks Ahead

Electrical workers eye automation maintenance

The International Brotherhood of Electrical Workers—one of the few building trade unions directly affected by automation—sees a rapid growth in job opportunities for its members flowing from the development of automation, particularly in the field of industrial maintenance. But it is also aware of the fact that electrical workers must be qualified craftsmen in order to get the jobs.

According to the union's research department, some of IBEW's prospects of getting on the maintenance-by-manufacturer bandwagon are illustrated by the situation now existing with Panellit, Inc., a Skokie, Ill., fabricator of instrumentation and control systems. Panellit Service Corp., whose craftsmen include IBEW members, installs and sets up—but also maintains—Panellit systems. Its first large installation was in the Tidewater Oil Refinery, Delaware City, Del., where PSC handles maintenance of the system and Catalytic Construction Co. of Philadelphia handles all other refinery maintenance. The union reports that all craftsmen employed are AFL-CIO building trades members, who receive building trades rates.

IBEW says it expects this trend to develop and that it has been working on its promotion for some time. To its members, it has accordingly issued a two-fold warning, which, in effect, is this: You must acquire a basic grounding in electronics and instrumentation and improve your skills in order to get work on automation equipment, and you can't get the work without going after it.

Shift of Teamster Control To Spark Membership Drive

A major membership drive by the teamsters union in the eastern, southern and central states appears to be in the offing as a result of last week's assurance that control of New York City's teamsters would pass on Feb. 19 to John J. O'Rourke, president of Local 282 of the building supply drivers union.

O'Rourke, who has had the backing of international vice president James R. Hoffa, was nominated without opposition for the presidency of teamsters' Joint Council 16, which covers the five boroughs of New York City plus Long Island and Westchester County. Before the nomination, incumbent president Martin T. Lacey announced his decision, attributed to personal reasons, not to run again.

Following these developments in New York, Hoffa announced in Chicago that one of the immediate results of O'Rourke's election on Feb. 19 will be the launching of a membership drive for teamsters in the area covered by the union's Eastern, Southern and Central States Conferences. Emphasis, he indicated, will be on the New York area and on merchandising establishments. He plans to call a meeting of conference leaders next month, he said, to work out the organization plans.

Taft-Hartley Amendments Introduced in U. S. Senate

In a bill introduced in Congress to amend the Taft-Hartley Act, Sen. Barry Goldwater of Arizona has proposed that the states be given control over picketing, striking, boycotts and walkouts. A similar measure was offered unsuccessfully last year.

Other amendments proposed by Goldwater would eliminate the present requirement that union leaders give a non-communist oath before their unions can use the processes of the National Labor Relations Board and would change existing provisions controlling voting rights of union members during strikes.

Goldwater said the non-communist oath is no longer required because of the housecleaning labor has conducted and because of additional authority granted last year to the Justice Department.

Licensing Tests Stir Up Complaints From Plumbers

Discord over licensing of plumbers has developed in Memphis, where 16 plumbers who failed the last examinations have taken their complaints to Public Works Commissioner Henry Loeb.

A spokesman for the plumbers said the chief complaints were these: The tests were not fair; questions covered methods no longer used in modern plumbing; applicants had to wait a month before being told results of the tests. An advisory committee to check the grading was appointed by the commissioner, who said:

"If you can tell me a fairer way to do this—since I know nothing about plumbing—I'll do it. I want you (aspiring plumbers) to get a fair deal and I want Memphis to get a fair deal."

In a November examination given by the Plumbing Licensing Board, 22 tried for master's licenses but only four passed; 21 tried for journeymen's licenses but only two were given journeyman's rating.

Bitterest complaints stemmed from the wiping of two lead pipes, a project that formed one part of the four-part examination. Other parts included blueprint reading and questions on costs and materials. In protesting the lead pipe portion, several asserted that lead is seldom used in modern plumbing, but some conceded its use in commercial work, particularly in laboratory and hospital construction.

Those who passed the master's exam became qualified to take out permits and to do plumbing contracting. The two who qualified as journeymen moved from an hourly rate of $1.50-$1.75 to one of $2.50-$3.25.

Fringe Benefits Added In 1957 Chicago Bargaining

Electrical workers and pipefitters are the first two Chicago building trades to complete their 1957 collective bargaining negotiations.

Their new contracts will run for one year. Effective May 1, electrical workers will receive an increase of 17 cents in their basic rates, plus another 6% for fringe benefits. They already receive 6% for health and welfare. On June 1, pipefitters will receive a boost of 18 cents in basic rates, plus an additional 7 cents for health and welfare. They now receive 7 cents for health and welfare and 15 cents for pensions. New basic rates will be $3.65 an hour for electrical workers and $3.55 for pipefitters.

Increases negotiated in the last two years have, in contrast, averaged about 7½ cents for most of the trades.

Laborers, carpenters, operating engineers, bricklayers and cement masons are still negotiating.

Labor Briefs . . .

• **AEC hearings**—The Atomic Energy Commission last week contended that the hearing on construction of the Monroe, Mich., reactor—opposed by several labor unions on the grounds of safety—could proceed without introducing restricted data as evidence. Labor lawyers, in a motion filed with the AEC, had demanded access to the data without clearance.

• **Wage boosts**—Members of five of the building trades in Seattle received a deferred wage increase on Jan. 2. Increases ranged from 5 cents to 25 cents an hour in basic rates and from 2 to 2½ cents in fringe benefits. Trades affected are plumbers, painters, carpenters, laborers and construction wiremen.

OFFICIAL PROPOSALS

Bids: January 29, 1957

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR THE
CONSTRUCTION OF THE 230 KB
TRANSMISSION LINE BETWEEN
BARNHART ISLAND AND
PLATTSBURGH NEW YORK
SPECIFICATION NO. PA-6-25
CONTRACT NO. T2

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the complete installation of the 230 kv transmission line between Barnhart Island and Plattsburgh, New York, until 10:30 A.M. Eastern Standard Time on the 29th day of January, 1957, at the Authority's office, 270 Broadway, Room 1305, New York, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are estimated:

587 wood pole structures of various types—poles, spar arms, cross and "K" braces furnished by the Authority.

872,000 pounds steel tower structures—structural steel and accessories furnished by the Authority.

71 miles of stringing—transmission line conductors and overhead ground wires furnished by the Authority.

furnished by the Authority.

The length of the project is 71 miles.

The work shall be completed on or before September 1, 1958.

Plans, specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York, New York, upon application and prepayment of a fee of Ten ($10.00) dollars for initial set and Five ($5.00) dollars for each additional set, no part of which will be refunded.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
General Manager

Bids: February 26, 1957

City of Detroit, Michigan

ADVERTISEMENT
FOR
CONSTRUCTION AND SINKING OF
CAISSON
FOR THE
RAW WATER BOOSTER PUMPING
STATION
AT WATER WORKS PARK
AND OTHER WORK
FOR
DEPARTMENT OF WATER SUPPLY
CITY OF DETROIT, MICHIGAN
CONTRACT NO. SE-2

Sealed proposals for constructing and sinking caisson for the Raw Water Booster Pumping Station at the Water Works Park Station and other work will be received by the Board of Water Commissioners of the City of Detroit, Michigan. Proposals shall be addressed to the Board of Water Commissioners, City of Detroit, Room 506, Water Board Building, 735 Randolph Street, Detroit 26, Michigan and shall be endorsed "Proposal for Contract No. SE-2". Proposals will be received until 2:00 p.m. Eastern Standard Time, February 26, 1957, at which time they will be opened and read aloud in the Board Room, Fifth Floor, Water Board Building, 735 Randolph Street, Detroit 26, Michigan.

The work consists of the construction of a reinforced concrete caisson, circular in plan, having an outside diameter of one hundred eight feet (108') and wall thickness of seven feet (7'), and sinking to a depth approximately 97 feet below the existing ground surface; construction of a caisson bottom seal slab; construction of fourteen foot (14') diameter water conduits leading into and out from caisson to stubs in existing raw water tunnel; revisions in shafts at the above-mentioned stubs; revisions in Shore Well at Water Works Park and revisions in Raw Water Tunnel Junction Chambers at Pennsylvania and Forest Avenues, and other work as specified. The location of the bulk of the work will be in Water Works Park, 10100 East Jefferson Avenue, in the City of Detroit.

The Contract Documents, including the Notice to Bidders, the Forms of Proposal and Agreement, the Specifications, and the Contract Drawings may be examined during business hours at the office of the Department of Water Supply, Room 706 Water Board Building, Detroit, Michigan. The Contract Documents may be obtained by making a deposit of Twenty-Five Dollars ($25.00) per set, which sum will be refunded upon the return of the complete Contract Documents in good condition within thirty (30) days after the bid date, or if used in making a bona fide proposal.

As security for the acceptance of the Contract, each proposal shall be accompanied by a certified check in an amount not less than five per cent (5%) of the total lump sum price bid, drawn payable to the City of Detroit, Board of Water Commissioners, or a satisfactory bid bond executed on the form provided in the Proposal which will hold and firmly bind the bidder and his surety unto the Corporation of the City of Detroit in the full amount of five per cent (5%) of the total lump sum price bid.

No proposal may be withdrawn for at least 60 days after the scheduled closing time for receipt of bids.

The Board of Water Commissioners reserves the right to waive any informality in any bid and to accept any bid, or to reject any or all bids, should it deem it to be in the best interests of the City of Detroit to do so.

CITY OF DETROIT
BOARD OF WATER
COMMISSIONERS
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Secretary

STATE OF MARYLAND, STATE ROADS COMMISSION. FOR SALE TO HIGHEST BIDDER. Sealed Proposals, offering to purchase, remove and dispose of existing valuable ferry terminal equipment of the former Chesapeake Bay Ferry System, located at Matapeake and Sandy Point in the State of Maryland, consisting of four (4) transfer bridges, four (4) buffer bridges, as well as gallows frames, towers, including all machinery and electrical equipment housed therein will be received by the State Roads Commission at its offices, 108 East Lexington Street, Baltimore 3, Maryland, until 12 Noon Eastern Standard Time on the 5th day of February, 1957 at which time and place they will be publicly opened and read. Pre-qualification of bidders not required. Bids must be made upon the blank proposal form which, with specifications will be furnished by the Commission upon application. No bids will be considered unless accompanied by a certified check payable to the State Roads Commission of Maryland, in the amount as set forth in the proposal form. The successful bidder will be required to give bond and comply with the Acts of the General Assembly of Maryland respecting contracts. The Commission reserves the right to reject any and all bids. BY ORDER of the State Roads Commission this 31st day of December, 1956. C. R. PEASE, Secretary. ROBERT O. BONNELL, Chairman. Order F-7677.

U. S. Government

GOVERNMENT OF IRAQ. DEVELOPMENT BOARD & MINISTRY OF DEVELOPMENT, BAGHDAD, NORTHERN IRAQ ELECTRICAL SYSTEM SUBSTATIONS, CONTRACT No. 10, CIVIL ENGINEERING WORKS. The Development Board and the Ministry of Development of the Government of Iraq invite tenders from experienced Civil Engineering Firms for the construction of the Civil Works for the Substations of Erbil, Mosul, Hammam Al Alil, Kirkuk, Sulaimaniyah and Sarchinar of the Northern Iraq Electrical System. Tender Documents may be inspected on and after January 14, 1957 until February 26, 1957 at the following addresses:— 1) Directorate General of Legal Affairs and Contracts, Ministry of Development, Development Board, Baghdad. 2) Embassies of Iraq in Washington, London, Paris, and Bonn. 3) Royal Legations of Iraq in Brussels, and Rome. 4) Honorary Consulate of Iraq in Stockholm and Egyptian Legations in Bern and The Hague.

U. S. Government

5) At the office of the Consulting Engineers, Messrs. Electrobel-Traction & Electricite 1, Place du Trone, Brussels. Firms desiring to tender may obtain two sets of Contract Documents, each set consisting of Volume 1, 2, 3, and 4, on and after January 14, 1957 until February 26, 1957, from either the Directorate General of Legal Affairs and Contracts at the Development Board Offices, Baghdad Iraq, or Messrs. Electrobel-Traction & Electricite, 1, Place du Trone, Brussels, Belgium, or the above-mentioned Embassies and Legations on payment of 20 (twenty) Iraqi Dinars or the equivalent. This sum will not be refunded. All tender documents are to be submitted in English, and they must be accompanied by a deposit of ID. 16,000 (Sixteen thousand Iraqi Dinars), which must be paid in cash to the Directorate General of Accounts of the Ministry of Development, and the receipt issued for such payment must be attached to the Tender Documents. Such deposit may be replaced by a Bank Guarantee from or through an approved Bank in Iraq. Tenders must be submitted in a sealed package and endorsed clearly on the outside with the words "NORTHERN IRAQ ELECTRICAL SYSTEM—SUBSTATIONS. TENDER FOR CIVIL ENGINEERING WORKS". They must be delivered to the Ministry of Development on or before 12 noon local time on April 1, 1957, if sent by post the tenders shall be registered, but Tenderers must assure themselves of delivery to the Board in due time. A letter of capacity, method of procedure, articles of association, are to be submitted with the tender at the same time. Tenders not submitted within the time specified or not accompanied by a receipt of the deposit or a Bank Guarantee will not be taken into consideration. The attention of the Tenderers is called to the fact that early completion of the project is desired, and therefore, an early completion date will be considered an important factor in the selection of the successful tenderer. The Development Board does not bind itself to accept the lowest or any tender. Minister of Development.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4825) will be received at Kanab, Utah, until February 28, 1957, for furnishing labor and materials for Glen Canyon Dam and Powerplant, Colorado River Storage Project, Utah-Arizona. Location on Colorado River in Coconino County, Arizona, 15 miles upstream from Lee's Ferry, Arizona. Principal items are excavation 4,500,000 cu. yds.; concrete 5,200,000 cu. yds.; furnishing 3,000,000 bbls. cement and 240,000 tons of pozzolan; and other work. Completion time 2500 days. For particulars, address Bureau of Reclamation, P. O. Box 267, Kanab, Utah; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

Engineering News-Record

Reaches Your Local Contractors

Its distribution among the contractors of any one state is in proportion to the number of contractors situated in that state. The Official Proposal Columns of *Engineering News-Record* offer precisely the same efficient service to municipalities, counties, state and federal departments in every section of the United States.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.10 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, P.O. Box 12, New York 36, N. Y.

Bids: January 31, 1957.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 31st day of January, 1957, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2, Lacy Ketchum, District Engineer, 109 No. Genesee St., Utica, N. Y.						
Schenectady and Montgomery (Rt. 58)	FARC 57-8	Amsterdam-Pattersonville, S.H. 8338 Rotterdam Junction-Pattersonville, S.H. 640 Project U-F-488(7)	5.88 (0.95 RR)	9" Cem. Conc. Pavt. 24' Wide=5.81 Mi.; Misc. Work =1.02 Mi.; Prestress. Conc. Beam Bridge 60'; Extend. Exist. 22' Reinf. Conc. Slab	$82,000 Plans $25	$1,486,000
DISTRICT No. 3, Wm. Robinson, Weigh Lock Bldg., Syracuse, N. Y.						
Onondaga and Oswego	FISH 57-3	Interstate Route 5 (Brewerton to Central Square) and Access or Local Roads Project I-1118(4)	3.32 (1.01 Acc.)	9" Cem. Conc. Pavt. 2 at 36' Wide=2.92 Mi.; Asp. Conc. Opt.=0.38 Mi.; Asp. Conc. Opt. Access=1.01 Mi.; Misc. Work=0.02 Mi.; 3 Hy. Sepa. Comp. I-Beams, 244.9', 90' & 127.6'; 1 Br. St. Arch & C.I.B. 44'8"	$360,000 Plans $50	6,520,000
Onondaga (Rt. 5)	FARC 57-9	Fayetteville Village: Genesee St., S.H. 5660 Project F-329(7)	0.25 (0.11 Int.)	9" Cem. Conc. Pavt., 50' Wide=0.12 Mi.; Asp. Conc. Ty. 1A=0.24 Mi.; Comp. I-Beam Bridge 260.5'	$24,000 Plans $10	434,000
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester, N. Y.						
Livingston (Rt. 36)	FARC 57-103	Caledonia-Mount Morris, Pt. 4, S.H. 5665 Project F-1053(4)	0.30	9" Cem. Conc. Pavt., 24'-36' Wide=0.29 Mi.; Misc. Work=0.01 Mi.; Continuous Girder Bridge 340'	$30,000 Plans $15	547,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, 65 Court Street, Buffalo, N. Y.						
Erie	FI NTC 57-11 PSC 9058	New York State Thruway—Niagara Section, Sub. N5; Elim. of the Grade Crossing of the New York Central Railroad and Porter Avenue: City of Buffalo Project I-865(13)	1.92 (0.92 Acc.)	R.R. Relocation=1.25 Mi.; 9" Cem. Conc. Pavt. Var. Wide=0.77 Mi.; Asp. Conc. Opt.=0.59 Mi.; Misc. Work=0.23 Mi.; R.R. & Hy. Sep. Comp. I-Beam, 192.5'; Ramp Comp. I-Beam, 223'	$75,000 Plans $25	$1,383,000
Erie	BIST 57-9	Connection between New York State Thruway-Niagara Section, Sub. N-8 and Base Line Road (Buckhorn Island State Park)	1.18	Asp. Conc. Opt.=1.16 Mi.; Misc. Work=0.02 Mi.; Comp. I-Beam Bridge, 60'	$10,500 Plans $15	$188,000
Erie (Rt. 5	FAC 57-1 FAC 57-2	City of Lackawanna: Arterial Route. Fuhrmann Blvd.-Hamburg Turnpike Viaduct and City of Buffalo: Arterial Route. Project U-750(7)	0.77	Substructure for Viaduct	$160,000 Plans $25	$2,936,000
DISTRICT No. 6, James H. Thomas, District Engineer, 30 W. Main Street, Hornell, N. Y.						
Alleghany (Rt. 19 and 244)	FARC 57-4	Friendship-Belmont, S.H. 5341; Belmont-Scio, S.H. 5476; Belmont-Phillips Creek, Pt. 1, S.H. 1559 Project F-332(7); F-514(4)	2.85	Asp. Conc. Opt.; Cl. Box Br. 22'; Repair Exist. Rig. Conc. Arch Br.; Reinf. Conc. Slab Br. 32'; Raise & Repair Exist. Truss Br.	$42,000 Plans $15	$770,000
DISTRICT No. 7, Robert W. Sweet, District Engineer, 444 VanDuzee St., Watertown, N. Y.						
Jefferson	FISH 57-2 FARC 57-15	Interstate Route 5 (Section 7C-1) and Access or Cross Roads including S.H. 425 and S.H. 237 Project I-IG 1118(5); F-327(10)	7.26 (6.79 Acc.)	Asp. Conc. Ty. 2B=0.21 Mi.; Asp. Conc. Opt.=13.23 Mi.; Grad. & Drain.=0.61 Mi.; 1 RR Sep. Comp. I-Beam, 140'; 4 Hy. Seps. Comp. I-Beam, 237.3', 149', 355.2' and 205.8'; 4 Brs. R.C. Twin Boxes 20' Each.	$395,000 Plans $100	$7,182,000
Lewis	FASS 57-13	Remington Corners-Indian River-Croghan, Pt. 2, Co. Rd. Project S-337(2)	5.37	Bit. Mac. Ty. 1 Pen. Meth. Pre-Stressed Conc. Beam Br., 180'	$38,000 Plans $25	$700,000
DISTRICT No. 8, K. G. Rauer, Acting District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Putnam (Rt. 9)	FARC 57-3	Peekskill-Fishkill, Pts. 3 and 4, S.H. 5156-5149 Project F-394(15)	4.06	Asp. Conc. Opt.	$19,000 Plans $10	$340,000
Rockland	HT 57-1 RC 57-1	New York State Thruway—Hudson Sect.—Sub. 9A and New Jersey State Line-Nyack, Pts. 3 & 4, S.H. 8136-5682	3.20 (1.52 Acc.)	Asp. Conc. Shoulders=3.94 Mi.; 9" Cem. Conc. Var. Wide with A.C. Shoulders=0.24 Mi.; Asp. Conc. Opt. and Misc. Work=0.17 Mi.; Misc. Work=0.37 Mi.	$18,000 Plans $10	$317,000
Ulster (Rt. 55)	RC 57-5	Napanoch-Montela, S.H. 603	3.70	Cable Guide Railing (RR Rail Posts)	$4,000 Plans $10	$75,000
Ulster (Rt. 55)	FASH 57-1 FARC 57-10	Gardiner-Kerhonkson, Pt. 3; Gardiner-Kerhonkson, Pt. 2, S.H. 8339 Project F-451(4)	1.61	Asp. Conc. Opt.; 1 Comp. I-Beam Br. 255'; 2 Reinf. Conc. Box Brs. 25.1' and 21.6'	$40,000 Plans $15	$723,000
Westchester	NET 57-1	New York State Thruway—New England Section—Sub. NE 3 (N.Y.N.H.&H.R.R. at Larchmont)	0.85	Modifications of R.R. Facilities and Re-routing of Communication Lines	$12,000 Plans $25	$220,000
Westchester (Rt. 9)	FARC 57-2	Peekskill-Fishkill, Pt. 1, S.H. 5147 Project F-394(14)	1.67	Asp. Conc. Opt.	$8,500 Plans $10	$156,000
DISTRICT No. 10, M. E. Goul, District Engineer, 328 W. Main Street, Babylon, L. I., N. Y.						
Bronx	FA MDE 57-2	Major Deegan Expressway & Extension (Cont. 19) (138th St. to N. Y. City—West. Co. Line). Project U-1082(23)	7.33	Miscellaneous Work	$11,000 Plans $15	$200,000
Suffolk (Rt. 27)	RC 57-6	Amagansett-Montauk Point, Pt. 2, S.H. 8381	7.49	Timber Guide Railing	$4,200 Plans $10	$78,000
Suffolk (Rt. 25, 25A, 111)	FARC 57-7	Smithtown-Port Jefferson, S.H. 5232A; East Islip-Smithtown Branch, S.H. 1208. Project S-430(3)	2.81	Asp. Conc. Opt.=2.62 Mi; Misc. Work=0.19 Mi.	$40,000 Plans $15	$742,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Assist. Prof.—To teach undergrad. courses in structures and applied mech. Salary depends on qualifications. Dept. of Civil Eng., Univ. of No. Dakota, Grand Forks, N. Dak.

Civil Engineer-Estimator: for industrial construction. Approximately 10-15 years of both estimating and job experience. Salary open, position permanent. Located in Florida. P-3632, Engineering News-Record.

Construction superintendent wanted for work in Florida to handle large highway, grading, paving and drainage projects. Must be experienced in preventative maintenance of heavy equipment. Give references and salary desired. P-3815, Engineering News-Record.

Position open with growing Midwest contractor to handle sewerage and waterworks projects, both underground and treatment plants, from estimating, bidding to completion on percentage of profits basis. Facilities available to handle 3-4 million dollar volume yearly. Build your income as high as your ability. Send qualifications to P-3636, Engineering News-Record.

Civil Engineers for design and construction of municipal and industrial sewerage, treatment and water supply projects. Old established consulting firm in Midwest has openings in permanent staff. Please send full information and references. P-3899, Engineering News-Record.

Graduate civil engineers about 30 years of age wanted for work in Midwest. Require experience in control of concrete. Some experience in control of soils or bituminous mixes highly desirable. $7,500-$9,000 range. P-3867, Engineering News-Record.

Field Office Engineer-Tunnel Contractor desires engineer to handle office engineering at job site in connection with project in New York State now getting under way. Please state age, qualifications and references in application. All correspondence will be considered confidential. P-3873, Engineering News-Record.

Manufacturing Engineer—Nationally known expanding manufacturer has several Production Engineering openings for young graduate Mechanical or Electrical Engineers with 2-3 years engineering experience in industry. Positions involve development of new manufacturing methods, cost reduction, new product development, and manufacturing operations control. Unusual opportunity for intelligent aggressive young man who finds himself limited for further advancement and desires more challenge and responsibility. In confidential letter give complete details on age, education, experience, and salary required. P-3703, Engineering News-Record.

Office Engineer and Assistant Engineer (two positions), desired for progressive Class 1, New England Railroad. Immediate placement for men with proper qualifications. State age, references, experience, education, salary required, when applying. All correspondence confidential. P-3730, Engineering News-Record.

Associate and Assistant Professors for fields of advanced strength, elasticity, dynamics and fluid mechanics. Start Feb. or Sept. Dept. of Applied Mechanics, Univ. of Kansas, Lawrence, Kansas.

Soils Engineer—prefer man with MS in soils about 1945 or 1946—to head up a design group in a firm of consulting engineers specializing in design of dams. Must be top-notch design engineer and supervisor. Salary open. Location Midwest. P-3942, Engineering News-Record.

Assistant to Chief Engineer: Unusual opportunity for qualified man with firm of consulting engineers in Pa. Candidate must be thoroughly experienced in design of highways, bridges and related structures and capable of directing staff. Please submit experience resume, references, salary requirements and availability. P-3914, Engineering News-Record.

Wanted . . . Heavy Construction Road Superintendent to work for long established New England contracting firm operating in New York and New England. Salary commensurate with experience and ability. P-3963, Engineering News-Record.

(Continued on opposite page)

EMPLOYMENT OPPORTUNITIES

DISPLAYED —RATES— **UNDISPLAYED**

The advertising rate is $31.80 per inch for all advertising appearing on other than a contract basis.
An Advertising Inch is measured ⅞" vertically on a column—3 columns 30 inches to a page.
Subject to Agency Commission.

$2.10 per line, minimum 3 lines.
Position Wanted ½ of above rate.
Box Numbers—counts as 1 line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

Send NEW ADS to ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36, N. Y.

SALES ENGINEER

Excellent opportunity in Western Pennsylvania-Northern Ohio-parts of West Virginia sales territory of expanding company for engineer 28-35 years desiring sales, promotion and construction work. Graduate preferred but experience may be substituted. Highway and concrete engineering background desirable for contacts with highway departments, contractors and concrete products companies.

Permanent position with excellent opportunity for advancement. Attractive salary, company car and expenses with liberal company sponsored benefits.

SW-3940—Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

NEW POSITION
Cincinnati Sewage Disposal
Superintendent
Mill Creek Sewage Works:

Salary range, $7830 to $8613 a year. Supervise plant operation of 129 mgd capacity plant, now under construction. Modified primary treatment, separate sludge digestion with sludge disposal. Must have four years experience in sewage plant operation, engineering degree, be able to qualify for Ohio P. E. and Class "A" operator's license. Management ability essential.

Liberal employment benefits, retirement plan.

Apply before APRIL 1, to:

CIVIL SERVICE COMMISSION
260 CITY HALL
CINCINNATI 2, OHIO

STRUCTURAL DRAFTSMEN
FOR HIGHWAY BRIDGE WORK
In New York City and New Jersey

BROWN & BLAUVELT

468 Fourth Avenue, New York City

44 Cooper Street, Woodbury, New Jersey

TOWNSHIP ENGINEER

Full time Township Engineer for Bridgewater Township, New Jersey, Somerset County. Must have P.E. license in New Jersey. Supervise township engineering functions, road maintenance, building inspector, plumbing inspector. Township of 14,000. Pleasant rural living. Salary open.

Reply with resume to Township Clerk,
Bridgewater Municipal Building
RD 5, Somerville, New Jersey

CIVIL ENGINEER

Young civil engineer interested in broad application of civil engineering.

Excellent opportunity with consulting firm. Liberal benefit plans and good working conditions. Location Middle West.

Send resume of education and experience with salary requirements to:

P-3223, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

RECENT GRADUATES

with structural ability to design or modify standard designs of steel buildings for industrial and commercial use. Expansion program underway offers very good advancement possibilities in design and sales. Permanent positions in pleasant Midwestern town. Send complete resume, with salary thinking.

P-3872 Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

Management Development And Training Supervisor

Erie Mining Company, a new large industry devoted to producing iron ore taconite pellets, is considering applications for a Management Development and Training Supvr.

Applicant should be a college graduate with at least 3 years' experience in organizing and handling supervisory programs, conference leading, craft and related training matters.

If you are interested in a wonderful opportunity, enjoy hunting and fishing, where there are excellent housing, school, and church facilities, insurance, vacation and pension benefits, why not send us a complete resume and salary desired to:

Mr. H. P. Brown
DIRECTOR INDUSTRIAL RELATIONS
P. O. Box 847 Hoyt Lakes, Minnesota

SPECIFICATION WRITER
ARCHITECTURAL

Excellent opportunity with nationally known manufacturer, located in the midwest. Send resume, stating education, experience, and salary expected.

P-3970, Engineering News-Record,
520 N. Michigan Ave., Chicago 11, Ill.

ELECTRICAL ENGINEER

Permanent opening in Boston office requiring good technical education and diversified design experience. Submit resume with availability and salary requirement or send for our application form.

FAY, SPOFFORD & THORNDIKE, INC.
Consulting Engineers
11 Beacon Street Boston 8, Mass.

BRIDGE ENGINEERS

DESIGNERS, DRAFTSMEN. Pleasant working conditions. Paid vacation, sick leave, hospitalization, life insurance. Interesting work on long range program. Vacancies in Orange, New Jersey, and Harrisburg, Pennsylvania.

BERGER ASSOCIATES, INC.
Second & Locust Sts. Harrisburg, Pa.

POSITIONS VACANT

(Continued from opposite page)

Design Engineer with estimating experience to join organization of general contractor specializing in heavy industrial and commercial work in expanding Ohio valley area. State experience, age, salary requirements, references, and date available. Seabright Construction Co., 4201 Wood St., Wheeling, W. Va.

Estimators—General Construction! Graduate Engineers, under 30, some experience, military active duty completed. Reply in full with references, recent photograph and salary required. Dondlinger & Sons Const. Co., Inc. Box 2033, Wichita, Kansas. Phone AMherst 53101.

Wanted Superintendent or Engineer experienced for sheeting and shoring on water and sewer lines. Immediate placement. State full details of background and salary desired. P-3919, Engineering News-Record.

Graduate Civil Engineers not over 30 and preferably single. Must have military training completed and interested in the building construction business, starting in the field. We offer opportunity for rapid advancement to ambitious, hard-working young men willing to accept responsibility. Starting salary $110.00 per week if inexperienced with higher wages for those with some experience. Send complete history data. Martin K. Eby Construction Co., Inc., 610 N. Main, Wichita 5, Kansas.

Permanent position available recent graduate or experienced engineer capable visualizing, designing, drafting, costing, building and equipment, and production line layouts of four plant upstate New York canned food processor. Write P-3964, Engineering News-Record stating resume education and experience.

Bridge Designers and Draftsmen with experience for permanent postions. Forward full educational, employment and personal data with salary requirements. Macomber & Faber, 1824 North Fourth Street, Harrisburg, Pennsylvania.

SELLING OPPORTUNITY OFFERED

Sales Representative to sell patented concrete forming system to residential and general contractors. Presently living in the Chicago area. To take over established midwest (5 state) area. Generous commission with drawing account based on requirements and ability. Must have general contracting or engineering background. Rocform Corporation, 15160 W. 8 Mile Road, Detroit 35, Michigan.

EMPLOYMENT SERVICES

Salaried Positions $6,000 to $35,000. We offer the original personal employment service (established 46 years). Procedure of high standards individualized to your personal requirements. Identity covered. Particulars—R. W. Bixby, Inc., 559 Brisbane Bldg., Buffalo 3, N. Y.

POSITIONS WANTED

Civil Engineer SM—MIT 10 years in design and hydro and chemical plant construction. Now in Jamaica. Available May. PW-3861, Engineering News-Record.

Supt. or Project Manager available for work in Florida or Georgia. Qualified and experience all phases. PW-3822, Engineering News-Record.

Drill Foreman; Recent, extensive Air Trac experience. Free to travel. Good references. PW-3812, Engineering News-Record.

Experienced Engineer-MASCE, BS and MSCE —35 years broad experience in investigations, reports, design, specifications and supervision of construction of water supply, water treatment, storm and sanitary sewers, sewage treatment, pumping stations and associated structures. Can work with others and can complete entire project from inception. Registered in 16 states—in excellent health—available at once. PW-3825, Engineering News-Record.

Concrete Superintendent. 32 years experience. Thoroughly experienced all phases concrete construction, batch crushing, washing plants. Precast. Placing, handling heavy foundations, highways, refineries, industrial. Coordinating all classes personnel, equipment materials Foreign or Domestic. PW-3823, Engineering News-Record.

Construction Superintendent past 2½ years on lump sum government work for Philadelphia General contractor desires job. PW-3844, Engineering News-Record.

Estimator, 18 years experience bidding, buy-ing, building municipal, industrial and Federal projects. Presently located Texas. $12,000 income. Desire percent-of-profits agreement. PW-3880, Engineering News-Record.

POSITION WANTED

Seeking controllership or administrative post with architect-engineer firm or engineering department. Expert in engineering management, organization, and accounting; also, budget, cost control, scheduling and economic studies. Practical engineering and accounting experience. Salary $15,000. PW-3984, Engineering News-Record.

Engineer wants to contact rated equipmt. manufacturer to build revolutionary machine in prestressing field in potentially heavy demand thruout construction industry. PW-3879, Engineering News-Record.

Structural Engineer, graduate, licensed, 30 years experience in design and construction, subways, industrial buildings, waterfronts, etc., available for responsible position. PW-3867, Engineering News-Record.

Project Manager or Superintendent available for work in Florida. Qualified and experienced all phases construction. PW-3907, Engineering News-Record.

Superintendent, heavy & bridge construction, 19 years experience, bid to completion, $200. PW-3901, Engineering News-Record.

Superintendent-Project Manager. Heavy construction all types 16 years experience. Cost and equipment conscious. Will relocate. PW-3960, Engineering News-Record.

Construction Accountant 39, 20 yrs. exp. field & office. Will re-locate. PW-3915, Engineering News-Record.

Structural Engineer—MASCE, BS, NY License, over 25 years in design and construction. Proven administrative ability. Fully qualified to supervise the design of industrial buildings, bridges and other structures. Available in 30 days. PW-3981, Engineering News-Record.

Inspection Service, General Construction. PW-3918, Engineering News-Record.

Construction Management. Engineering background. Experienced in all types of const. work. Project manager, office manager, supervision, and estimating 30 years experience, licensed P.E. Large industrial to housing projects field or office. Age 53. PW-3920, Engineering News-Record.

Civil Engineer, California License, many years varied design experience mainly on commercial and industrial projects. Desires position in Los Angeles area. PW-3977, Engineering News-Record.

Construction Executive-project manager, chief engineer, superintendent, wide experience with contractors and engineers on domestic and foreign work. Have handled most types of construction. Over twenty years as superintendent, project manager, project engineer, chief engineer. Been in present position five years. Desire change for good reasons. Location immaterial. For full particulars write PW-3956, Engineering News-Record.

Construction Superintendent; industrial, commercial, institutional, large scale housing, etc.; 25 years field supervision, desires similar position offering long range opportunity, can travel, N. J. resident. PW-3980, Engineering News-Record.

Civil Engineer, BSCE, Registered, Age 32 desire foreign assignment as project mgr. or resident engr.—7 years diversified supervisory, design, & construction exp. in water & sewer systems, treatment plants, utilities, marine const., dredging, bridges. Available soon. PW-3219, Engineering News-Record.

Construction Superintendent 25 years experience in supervising the construction of industrial projects, hotels, schools and industrial buildings. Have supervised government projects. Can go anywhere. PW-3975, Engineering News-Record.

Engineer-Commercial Pilot, 6 years experience estimating and office engineering industrial and commercial masonry. Desire opportunity combining flying and engineering. Present salary 9000. PW-3974, Engineering News-Record.

Engineer Architect representative; General Superintendent or project manager experienced in Air Field, commercial buildings, industrial and chemical plant construction; also highway, grading and drainage. Available on short notice for assignment domestic or oversea's. PW-3983, Engineering News-Record.

SELLING OPPORTUNITIES WANTED

Engineer, retired, own office, will sell to builders, contractors, architects. BA-3927, Engineering News-Record.

Caribbean based engineering organization, interested in representing lines of Engineered products. Staff of 30. Contacts with Government officials and leading industrialists throughout area. RA-3978, Engineering News-Record.

Engineers Designers Draftsmen

Live, work in San Francisco—
World's most perfect year 'round climate!

- **WESTERN KNAPP ENGINEERING CO.**

has immediate openings in these fields:

- ***Structural Design***

—3 years min. experience on heavy industrial plant steel and reinforced concrete structure.

- ***Piping Design***

—3 years min. experience in process slurry, reagent and sanitary piping for heavy industrial plants.

- ***Electrical Design***

—3 years min. experience in heavy industrial plant lighting, power control and switch gear.

- ***Mechanical Design***

—3 years min. experience in heavy industrial plant equipment layout. Experienced in mine plant, cement plant, smelter bulk material handling of special value.

- ***Mining Engineer***

—3 years min. experience in shaft and open pit mine layout and design.

Unlimited opportunities for position and salary advancement with an interesting and expanding organization.

Excellent starting salaries commensurate with ability. Liberal company benefits. Relocation Benefits. Ideal working conditions.

Qualified Applicants will be interviewed locally.

Write, Phone or Wire: Mr. Stratton

- **WESTERN KNAPP ENGINEERING CO.**

650 5th St. *Exbrook 7-1717* San Francisco, Cal.

HYDRAULIC ENGINEERS

Engineering graduates needed for California's growing water development program.

The work is challenging, interesting and of long range. It includes design and construction of big dams, power plants and statewide aqueduct system; water quality and flood control, and research.

The positions are open to recent college graduates in civil engineering. BSCE degree starts you at $436 a month with first raise in six months.

Promotional opportunities, on-the-job training, liberal vacations, generous retirement, and other State benefits.

For illustrated booklet and details write

C. S. Warner, Supervisor, Section H
State Personnel Board
801 Capitol Ave., Sacramento, California

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- Piping
- Mechanical

ENGINEERS

Our Metals, Refinery and Industrial Divisions offer you wide choice of opportunity to make full use of your talents, with excellent prospects for promotion to supervisory, staff and executive posts.

Broad diversification of work in our three engineering divisions assures you *permanent* security of employment.

You can build a strong foundation for your future with McKee. For complete information on the McKee organization and the extra benefits this company offers you write for our folder "The Key to Your Future" or contact us by telephone.

Telephone TOwer 1-2300, Cleveland, Ohio or write to Edward A. Kelner Arthur G. McKee & Company 2300 Chester Ave., Cleveland 1, Ohio

Arthur G. McKee & Company

Engineering offices in

CLEVELAND, OHIO • UNION, N.J. • TORONTO, ONT.

ENGINEERS

Long established firm of consulting engineers with world-wide practice needs both beginners and experienced civil, electrical, mechanical, and foundation engineers for interesting work on large dams, powerplants, and river control works. Permanent positions. Liberal employee benefits. Starting salaries dependent on qualifications. Please send complete resume to Hugo Niemi, Personnel Manager.

HARZA ENGINEERING CO.

400 W. Madison St. Chicago 6, Ill.

BECHTEL

AREA ENGINEERS
SENIOR ENGINEERS

Foreign Employment

Saudia Arabia or Sumatra

Field Engineers with refinery or related construction experience.

Office Engineers with heavy industrial construction experience on planning, estimating, costs, material takeoff, scheduling.

No Family Housing

Send resume to:
Manager of Employment & Placement
Industrial Relations Division

BECHTEL

Engineers, Builders for Industry

220 Bush St. San Francisco, Calif.

Recruiting Offices in New York, Los Angeles, San Francisco and Houston

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STRUCTURAL and MECHANICAL DESIGNERS

Having experience with heavy material handling equipment

Permanent Position For Qualified Men

HOSPITALIZATION INSURANCE VACATION

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7000 CENTRAL AVE. Cleveland 4, Ohio Telephone EN 1-0842

ENGINEERS

Come South!

We have immediate openings for Engineers — Designers — Detailers — Draftsmen Civil — Highway — Structural — Traffic — Architectural — Mechanical — Electrical (Currently no field positions available) Company-paid hospitalization, life insurance and retirement. 40-hour week. Air-conditioned offices. Salaries $400 to $800, depending on education and experience. Permanent position. Excellent opportunities for advancement. Send complete resume of education and experience with salary requirement to:

PALMER and BAKER, INC.

P. O. Box 346 Mobile, Alabama

ENGINEERS!

Immediate Career Opportunities!

A MAJOR OIL COMPANY . . .

WANTS—Young (under 30) personable, capable, sales-minded M.E.'s, Ch.E.'s and C.E.'s with management potential. (Servicemen returning to civilian life within 6 months will be fully considered)

OFFERS—good starting salaries, choice of location within U.S., outstanding benefits, interesting and varied assignments (in sales, distribution and engineering), thorough training, regular appraisal, advancement on merit leading to management positions.

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P-3890 Engineering News-Record
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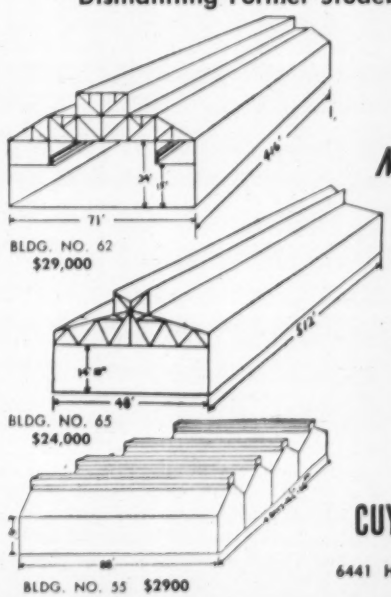

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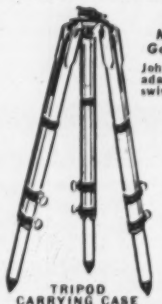

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Editorials

A Disaster to Remember

SEVENTY-SEVEN YEARS AGO last month a bridge across the Firth of Tay in northeastern Scotland collapsed in a windstorm. It was the longest and the highest bridge in the world at the time—over 5,000 ft from end to end, in 85 spans supported 88 ft above the water. It had been in service only 18 months, and at the time its designer, Thomas Bouch, was busy on plans for an even greater bridge to cross the Firth of Forth.

But Thomas Bouch did not design the Firth of Forth Bridge that we now know so well. He died, broken, demented and disgraced less than a year after the thirteen through-lattice-truss spans of malleable iron—eleven of 245 ft and two of 227 ft—in the center of his Tay Bridge collapsed in a windstorm, carrying with them a six-car train on which seventy-five men, women and children rode to their death.

As the most catastrophic structural failure the engineering profession ever suffered, the Tay Bridge collapse and the circumstances that surrounded it should not be forgotten. Thanks to a book just published, they need not be. Called "Disaster at Dundee" (Harcourt, Brace and Co., $4) its author, John Prebble, an English writer, has recreated the background and the aftermath of the Tay Bridge collapse in terms of the people involved. These include the railway owners who gambled on it as a means of meeting competition from another railway company, the engineer whose ambitious dreams of achievement blinded him to his own inabilities of design and administration, the contractors who built it, the train occupants who lost their lives, and the members of the board of inquiry. It is a book of human action and reaction rather than a technical study, yet the technical details are not lacking.

Many facts about the Tay Bridge disaster stand out as having lasting suggestive value to anyone connected with construction enterprises where lives may be at stake: The designer confused being a promoter with being an engineer. He tried to make up for his own lack of ability by taking chances on the opinions and aid of others whose ability he was not able to judge. He based his foundation design on boring data which were incompetently collected and badly interpreted. He used a wind load of 10 psf when a little more interest in things outside the narrow confines of his own experience would have revealed that five times that load was common practice in France and America. He trusted the contractor, and the contractor trusted his foundry foreman to supply the cast iron columns, without supervision or inspection, with the result that blow holes, which should have caused rejection of the columns, were filled with beeswax and iron filings so they would not be seen. He permitted himself to inherit a financial interest in the contracting firm, which may have warped his judgment of its work on the bridge and at least subjected him to suspicion.

There were other shortcomings, too, all adding up to a confirmation of the opinion expressed by the British magazine, "The Engineer," shortly after the disaster. Said the editor, "All the evidence goes to show that the design of the bridge was defective to such an extent that no perfection of material could make it better; while no defect in the quality of the metal could make it worse." That such extreme condemnation could ever again be applied to an engineering structure is unthinkable, but keeping the Tay Bridge disaster fresh in memory could still be good insurance.

Should Bridges Be Wider?

WE HAVE COME A LONG WAY since the days when every bridge was a narrow place in the road. But are our wider, modern bridges wide enough? This question, which has become increasingly more persistent, is again emphasized as the interstate highway program gets under way.

Modern design calls for bridges less than 150 ft long to be made the full width of the highway pavement and its shoulders. This is progress over the old days when not even the full pavement width was accorded room on many bridges. Yet on modern longer structures some of this ancient practice is still in vogue; the pavement is carried through, but not the shoulders.

Considering modern traffic density and speed, leaving off the shoulders dangerously narrows the highway on every long bridge. There is no place for stalled cars to park, and no leeway for maneuver should it suddenly become necessary.

The reason for narrowing long bridges is, of course, largely economic. It would add considerably to the cost to increase bridge widths by 20 ft—two 10-ft shoulders. Yet, relatively, on highways costing up to and beyond a million dollars a mile, the cost increase would hardly be prohibitive.

There is the additional deterrent to wider bridges of excessive lengths required for floorbeams. Yet this, too, is being removed by the practice of building separate parallel bridges for opposing traffic lanes.

Wider bridges are well worth considering. A good many millions of dollars have been added to highway costs to make roads more attractive by landscaping. A few more millions added to make them safer by wider bridges should be at least as good an investment. And there is always the traffic growth factor to be considered. Widening a bridge after it has been built is often an expensive and troublesome operation. Perhaps if economic studies put a somewhat higher value on the safety and future growth factors involved, wider bridges might be found to be justified.

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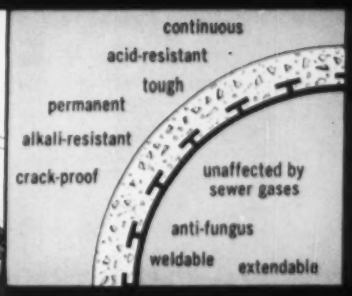

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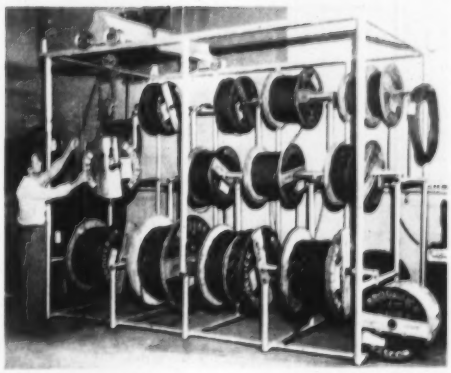

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